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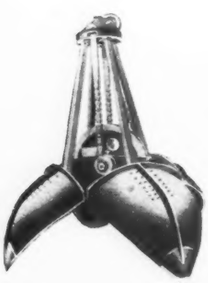

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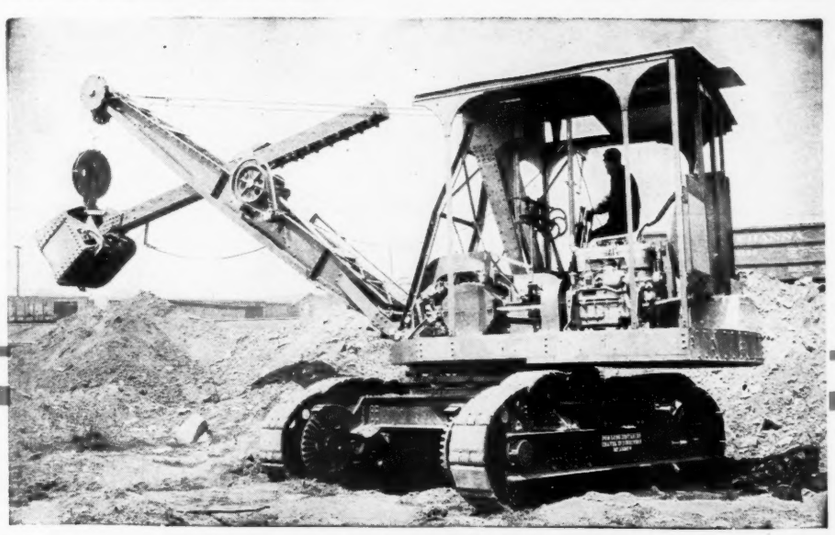


Rock Products

Volume XXVII | Chicago, September 20, 1924 | Number 19

Long Island Plant Which Dry-Screens the Sand Before Washing the Gravel

Plant of O'Brien Brothers Sand and Gravel Corporation Near New York, Which Will Shortly Produce 10,000 Tons Daily

THE north shore of Long Island produces a large part of the sand and gravel that goes to the New York City market. The island here is made up of rolling hills, presumably of glacial origin, which are deposits of excellent sand and gravel. With land selling at $4000 to $5000 an acre, as it does in these parts, one thinks first of the large investment that must be necessary before building a plant. But the cutting down of these hills is in many cases an improvement and the property is at least as valuable after leveling off as it was before and in some cases more so.

One of the large plants operating in this section is that of the O'Brien Brothers Sand and Gravel Corporation, near Port Washington, L. I. The principal owners of this plant are also a contracting company and under a third incorporation they operate a fleet of 125 barges and tug boats that transport the product of the plant to the New York wharfs as well as doing other jobs of water transportation.

Production in these parts is reckoned by barges instead of cars, a standard barge loading 600 to 650 yd., not tons. All sales are made by yards, and the barges are carefully loaded and smoothed off to definite lines to allow the measurements to be made with certainty. The O'Brien Brothers plant produce seven barges daily or something over 6000 tons. This will be increased to 12 barges daily after October 1.

The material is dug by two Marion steam shovels, one No. 7 and one No. 75. An Osgood convertible shovel with ¾-yd. dipper is also employed but was functioning as a crane at the time the plant was visited. The Marion shovels have 4-yd. dippers.

The shovels load into standard gage 30-ton Koppel steel cars with hopper bottoms. They are pulled into the plant hopper by four saddle-tank locomotives, two made by the American Locomotive Works, and two by the Vulcan Iron Works.

The cars have a 12-in. grating on top and this acts as a grizzly to take out the big boulders, of which the deposit contains a fair proportion. On reaching the plant hopper these boulders are lifted off by a derrick, using a contrivance like a pair of ice tongs to lift the stone in the place of a bucket. These boulders go to a 36x24-in. Farrell jaw crusher (Earle C. Bacon), which is set below the ground level. The product of this crusher goes to a belt in a tunnel where it joins the other material going to the washing plant.

The hoppers into which the cars are unloaded are of concrete and long enough to permit two or three cars to be unloaded at once. They are covered with a bar grizzly,

View of washing plant and office. The pit is behind these

the bars spaced 4 in., and the oversize of this grizzly goes by a belt to a 24x13-in. Farrell crusher. Another set of concrete hoppers with grizzly and belt was under construction at the time the plant was visited.

All material that passes the 4-in. bar grizzly goes on a belt to the elevator of the dry screening plant. Here is a unique feature in sand and gravel practice, the dry screening of sand from gravel as a preliminary operation. It would not be possible except in a deposit that is dry and also one that contains very little clay. In wet weather the entire product has to be sent to the washing plant, even in this plant. But so long as the weather will permit dry screening is followed.

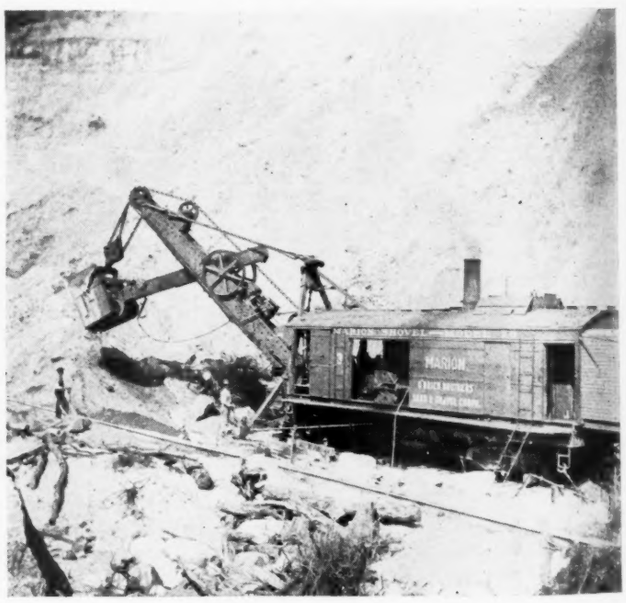
The screen used is a simple gravity screen which is made at the plant. There is a frame of 2x8-in. timbers which is 20 ft. long and 5 ft. wide. Rods cross it the short way and these are ¾-in. diameter and spaced 8 in. centers. On top of these ⅛-in. wires are laid exactly ¼ in. apart, and tied in position with common baling wire. These wires and rods make meshes ¼-in. wide and 7¼-in. long, the length being in the direction the material travels.

The elevator discharges at the head of these screens, which are set between 40 and 45 deg. The work of these gravity screens is very good, the passage of the heavy pebbles and stones keeping them "alive" and preventing blinding.

The reason for screening out the sand dry is that several customers of this company want dry sand and are saved considerable expense for drying by purchasing this product. Some of this sand is used to mix in prepared wall plaster. But the dry screening has the further advantage of greatly increasing the tonnage that can be put through the washing plant.

The sand falls on a hopper and is car-

View of pit. The dry screening plant at the left separates the sand. In good weather only gravel goes to the washing plant. The belt in front takes the dry screened sand to the dock

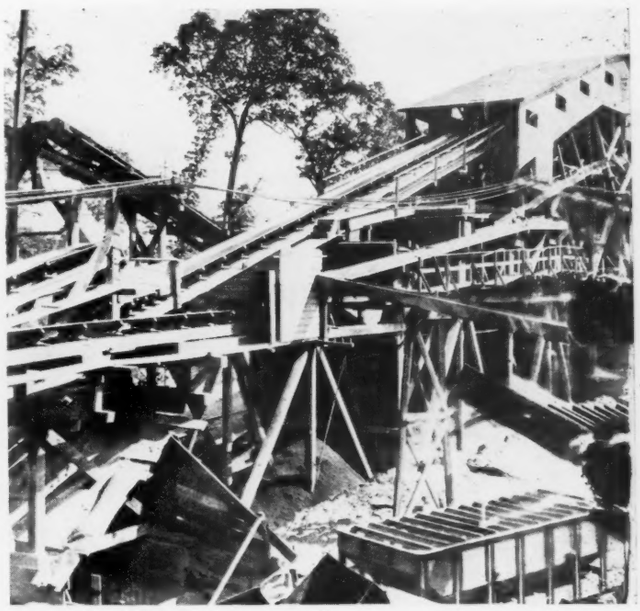


Left—View of gravel pit from washing plant. The spoil in the center is large boulders such as are now sent to the crusher. Right—One of the two steam shovels that dig the bank material

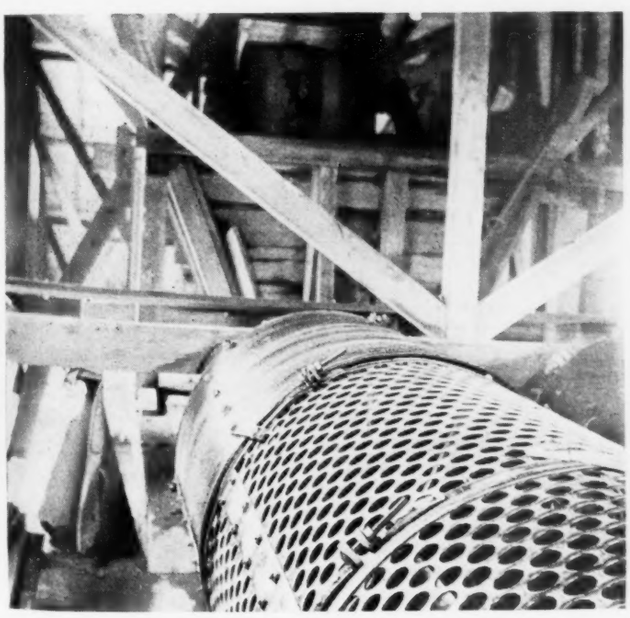
ried on a belt which discharges on one of the conveyor belts that load barges at the dock. The oversize falls through a chute to a revolving feeder that delivers it to the belt that feeds the washing plant.

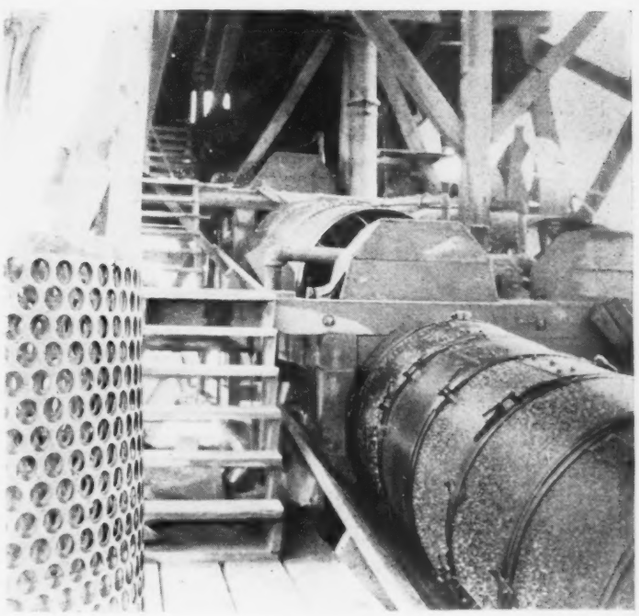
This feeder is a cylinder revolving in the mouth of the chute and there is a set it goes to a hopper, 10x12 ft. and 8 ft. deep. Water from two 8-in. Worthington centrifugal pumps is added at this hopper to the amount of 3,000 gpm. and the stream from the hopper is turned into two 16 ft. washing screens. The first 4 ft. of these screens is blank to act as a plant will pass through a 2-in. round hole.

The undersize of the screen passes through three sets of Farrell revolving screens with 1¼-in. and ⅜-in. perforations. The oversize of each goes to a bin and the final undersize (minus ⅜-in.) goes to plain sand settling boxes, 20 ft.



Left—Big boulders are held on the grate on top of the car and are carried by a derrick to the crusher. Right—Conveyors from the hoppers to the washing plant. The reverse conveyor brings the screen oversize to the 12x20-in. crusher. Note grate on car in foreground





Left—Hopper under conveyor and washing screen. Right—Sizing screens and pipes for washing sprays

of paddles on a shaft above it that keeps the material stirred and prevents it from arching. This addition to the regular cylinder feeder was devised by J. H. Jones, the plant superintendent, and it works very well in keeping an even feed.

The plant elevators take all the material under 4 in. to the top of the plant where scrubber. The screen portions have 2-in. round holes and the oversize goes to a hopper at the side of the main building. From this hopper it goes to a 6x36-in. Farrel crusher and thence is carried up on a conveyor belt to a chute which delivers it to the plant belt and so back to the screen. Hence all the product of the long by 3 ft. wide, with hand operated valves. The dewatered sand falls into a bin.

All the bins, which are really no more than open spaces separated by bulkheads, are built above a concrete tunnel in which pass two conveyor belts which take all the products to the dock to be loaded on barges. They are in two stretches. The

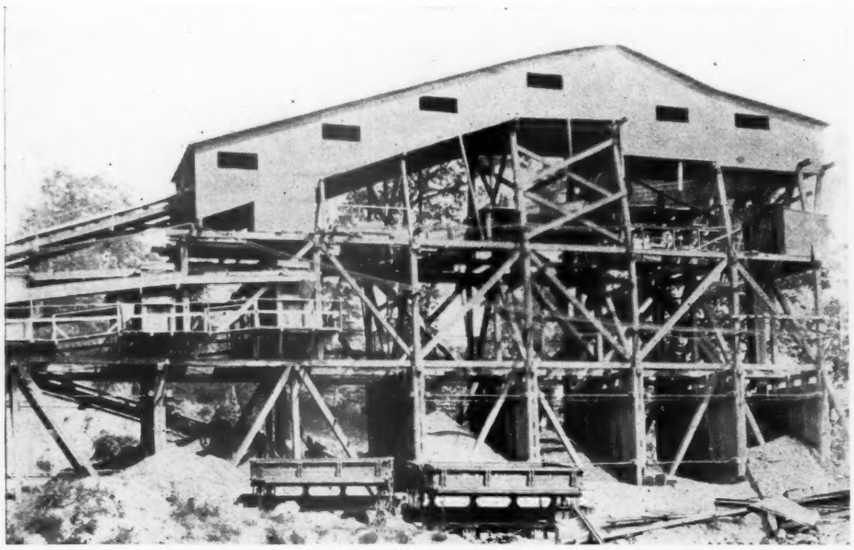
first, 180 ft. long, passes under the bins and delivers the sand to two other conveyors in a tunnel which runs under the concrete highway that runs between the plant and the dock. These second conveyors carry the material 435 ft. to a hopper on the dock from which it is spouted to the barges. Two 30 hp. Allis-Chalmers motors run the shorter conveyor and two 75 hp. motors of the same make, the longer.

The reason for the two parallel conveyors is that it permits two sizes of product to be loaded at the same time. The sand from the dry screening plant keeps one conveyor busy practically all of the time and various sizes of gravel are loaded by the other conveyor from the bins.

These conveyors and all the others in the plant were furnished by the Robbins Conveying Belt Co. They are 36-in. belts which run on sets of five troughing idlers. The running of these belts is quite free from any side motion and is remarkably steady and uniform. They have each a capacity of 600 yd. per hour at their present speed of 265 ft. per minute. This could be considerably increased if added capacity were needed. As it is they can fill two barges every hour.

The troughing rolls are set to the natural curve of the belt and are grease lubricated through holes in the stationary shaft. Plain rolls, grease lubricated, are used on the return side. The tension on the belts is maintained by screw take ups with ball and socket bearings so that the shaft cannot be "choked" if the two take ups are not set the same.

There are no feeders between the bin and the belt but Robbins double-cut off gates allow the material to flow into a chute so that it falls on the belt with about the same speed as the belt travel, thus obviating wear. There are two gates for each bin over each of the belts, making four in all from which the same size of material may be delivered.

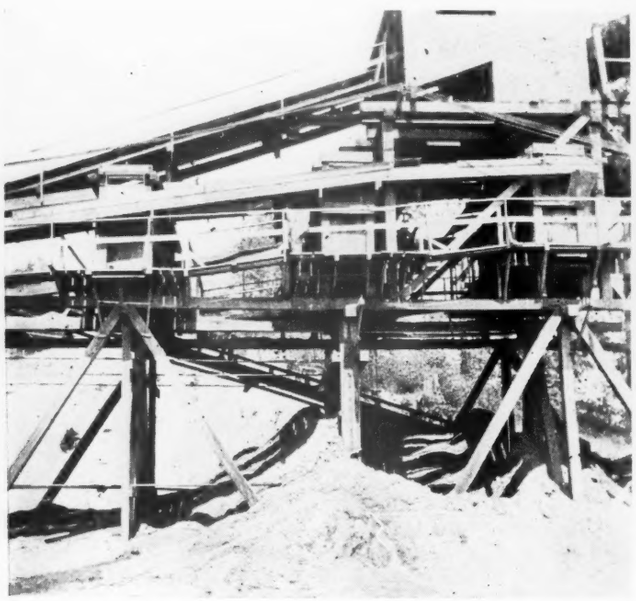


Washing plant. The open end bins have each four bottom gates to deliver to the conveyor in the tunnel below

John H. Jones, superintendent, who designed the plant (front) and Walter F. Fleming, general manager (rear)

At the dock end the material falls from the belts into a hopper which feeds into two swinging spouts, both of which may feed into a barge on the same side or into two barges on opposite sides.

The products of the washing plant are: "grits," between ¼-in. and ⅜-in., three-



Left—Sand settling boxes which are 20 ft. wide and 3 ft. long. Right—Motor house which is built over hopper between the bin belts and the dock belts

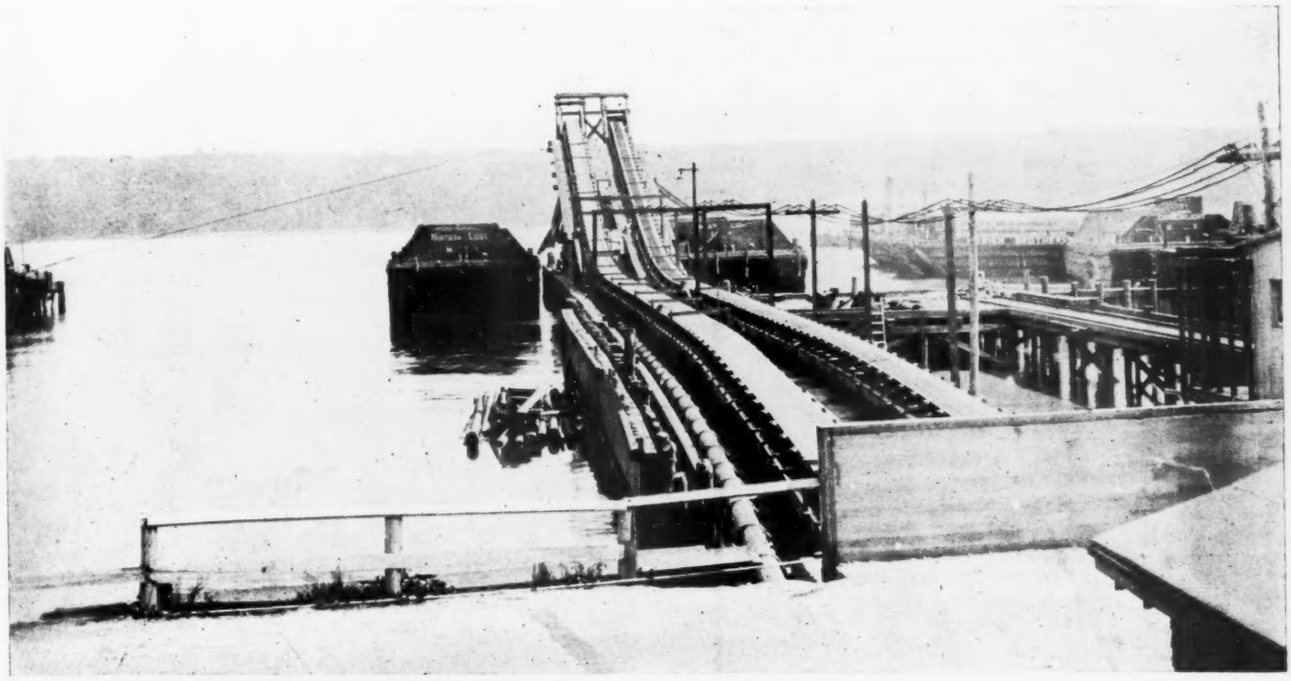
quarter gravel, between ⅜ in. and 1¼ in., and inch-and-a-half gravel, between 1¼ in. and 2 in. The "grits" are sold mainly to the makers of concrete blocks, of which there are many in and around New York.

by hand from accumulations in the pit as they are loaded on the truck. Their principal use is to make gutters along the driveways of private estates.

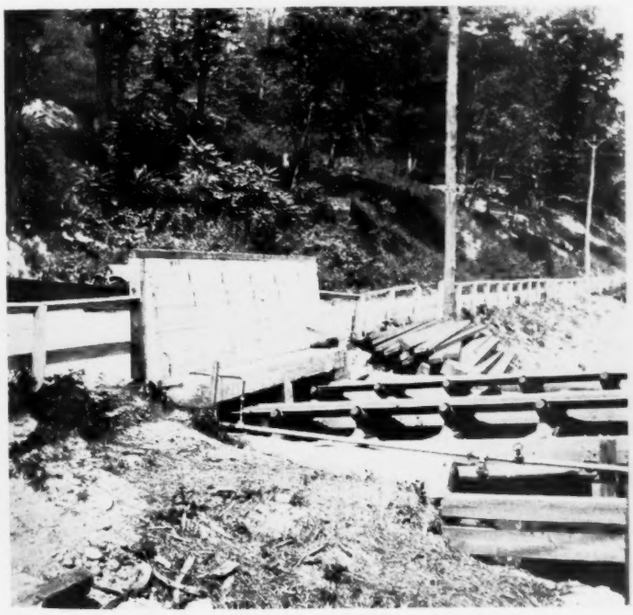
All the machinery for the washing plant

20 years. He designed and built the Phoenix and one other plant in this district. Like a number of other rock products men, he began life as a miner in the West.

Walter F. Fleming, vice-president of the



The 36-in. barge loading conveyor belts, 435 ft. centers, which run under the highway and to the end of the dock



Left—Where the belts come out of the tunnel under the concrete highway. Right—End of the conveyor structure on the dock and the swinging spouts for loading barges

The other sizes are usually sold for concrete aggregate. At times there is more of the screen oversize (between 2 in. and 4 in.) than the crusher can handle, and this is not crushed but is sold for filling-in jobs and road base material. There is a considerable sale of cobbles, between 6 in. and 8 in. but these are picked out

was furnished by Earle C. Bacon, Inc. Belts were by Robbins, Quaker City and New York Belting and Packing companies.

John H. Jones is the superintendent and mechanical engineer of the plant and he designed it nad superintended its construction. Mr. Jones has been connected with the sand and gravel business around New York for

company, is general manager and is in charge of operations at the plant. Mr. Fleming organized the company and began the production of sand and gravel from this deposit. Thomas F. O'Brien is president of the company and Joseph J. O'Brien is treasurer. The main office is at Port Washington.

Make Sand from Gravel Successfully

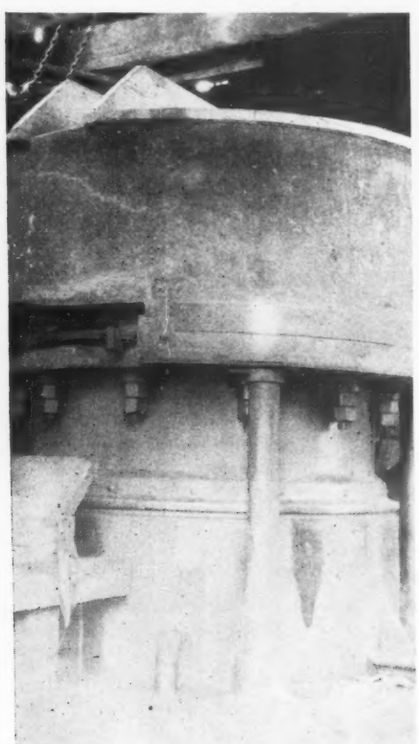
T. L. Herbert & Sons, Nashville, Tennessee, Market Surplus Gravel as Sand

THE problem of what to do with too much gravel is one that interests many sand and gravel producers in the United States. In New York and Pennsylvania, where gravel is frowned upon as aggregate for highway purposes by the state highway departments, it is a pressing problem at some plants which have accumulated small mountains of gravel for which there is only a limited market but which has to be dug and sent through the plant in order to obtain the sand.

In other cases the deposits contain so much more gravel than sand that the production is unbalanced. The gravel sells readily and at a good price, but gravel alone will not make concrete. Sand is required in half the amount according to the usual practice. If the deposit contains a greater proportion of gravel than two to one (of sand) there is bound to be a surplus of gravel in the hands of the producer.

This was the case of T. L. Herbert & Sons, of Nashville, Tenn. The way they solved the problem and made a market for this surplus gravel is an interesting story.

In the beginning Harvey Herbert, who is the engineer of the brothers, in this building material firm, was looking for a screen to use on a dredge. He heard that the inventor of the Symons disk crusher was working on a screen that promised to be what he wanted and went to Chicago to investigate. He lost interest in the screen when he heard of the vertical type of disk crusher which had been developed and finally bought one of the makers, Chalmers & Williams.



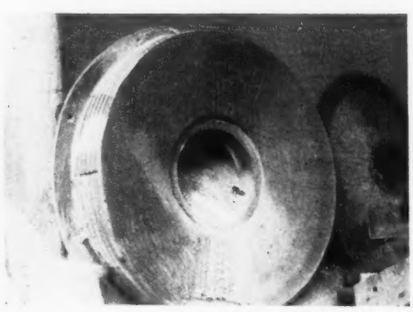
Symons vertical disk crusher

The first efforts to make sand out of gravel with this machine were unsuccessful. The machine was tried on wet gravel just as it was unloaded from the barge and it was hard to get a ton an hour through the machine. Mr. Herbert investigated and found that all the crushing was being done in a 2-ft. circle on the disks. As the disks are 48 in. in diameter this meant that only one-fourth the area was working.

He decided that the disks must be given a greater slope to carry the gravel farther from the central feed and had a set of disks made from his own design. He also decided that drying the gravel on a stock pile would make it run through the machine more easily and thus increase the capacity. When the new disks were in place and the machine was fed with dryer gravel the capacity jumped up to 20 tons per hour which was satisfactory so far as taking care of the excess gravel was concerned.

A market was immediately found for the new material as a top dressing for roads. The original gravel is made up of hard pebbles, so that the crushed material makes an excellent wearing surface. All the rock dust is retained in the product and this makes an excellent binder and absorbent for the oil with which the crushed gravel is applied. All the counties about Nashville buy the material, one county alone using 20,000 tons per year.

The disk crusher is on the ground floor, the feed bins above, and the rotary screen above the bins. The product is spouted into the yard at the side



Disk that made the success of the machine as a gravel crusher

The plant is simplicity itself. A hopper is filled with gravel by a locomotive crane and the gravel runs by gravity to the vertical Symons disk crusher. The crushed product is elevated to a rotary screen above, the undersize of the screen being spouted to storage piles and the oversize returning to the crusher. A 50-hp. motor drives the whole plant.

The product is not exactly sand as it is made through a ¾-in. screen. But by far the greater part of it is reduced to sand size. The mixture of sizes made by the ¾-in. screen has been found preferable to finer material for the purpose for which it is sold.

Clean Sand for Storing Vegetables

A MINOR use for clean washed sand is that of storing vegetables in winter. Beets, potatoes, carrots and parsnips may be stored in sand in a dry basement and will not rot or sprout. Of course the sand must be dry and, especially, it must be free from loam and organic matter. Cabbages set in a bed of clean sand in a basement will keep until well into the winter provided the heads do not touch.

German Research on High Alumina Cements

Thorough-Going Study of the Range of Lime-Alumina Combinations

By Dr. C. R. Platzmann
Berlin, Germany
Written Especially for Rock Products. Translated from the German by R. W. Scherer, Milwaukee, Wis.

THE MANUFACTURE on a commercial scale of "cement fondu" and of *ciment electrique* in France have led to further investigations of cements high in alumina and their properties, although the question

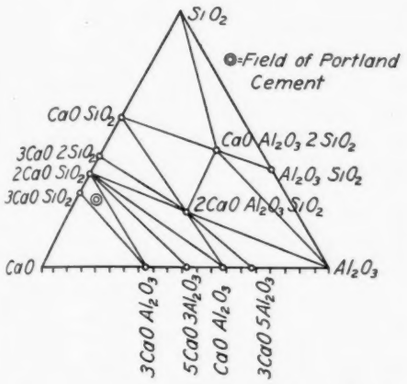


Fig. 1—Showing the field of portland cement compared with that of other lime-silica-alumina compounds

has been repeatedly discussed and to my knowledge discussed by O. Schott for the first time in 1906. In 1910 at Atlantic City, H. S. Spackman reported on experiments with aluminates before the American Society for Testing Materials. E. Killig then took up the work and reported at the annual meeting of the Society of German Cement Manufacturers in a similar series of tests conducted by him in which sufficiently large experimental batches had been produced to show compressive strengths of 500 to 600 kg. per sq. cm. after 28 days. While the acid aluminates throughout were slow setting and showed considerable strength (up to 512 kg. per sq. cm. for the combination ($2Al_2O3CaO$), the basic aluminates, on the other hand, proved very quick-setting and developed little or no compressive strength.

In more recent times the French scientist Bied and the Americans, Spackman and Bates of the U. S. Bureau of Standards, have occupied themselves more especially with this line of research, Mr. Spackman reporting in this journal (December 8, 1922, pp. 30-32). The conclusions arrived at differ substantially. Bates not only carries out the exact microscopic determination of the component parts and the combinations that take place in hydration, but also undertook exhaustive mechanical tests of the materials. The conclusions arrived at, quite in agreement with the earlier results of Killig, are that aluminates high in lime are quick-setting, while those low in lime are slow-setting, and that the hydration of the latter depends on the formation of hydrated Al_2O_3 and hydro-calcium aluminates. The high initial strengths he ascribes to the rapidity and completeness of the hydration of the aluminates and to the formation of a large proportion of colloidal substances. He believes, however, and in this belief differs from Bied and Spackman, that high alumina cement, with the sensitiveness of the colloids to change in moisture, is not suited for buildings and structures, subject to the actions of water.

Recently some contributions to this question have been published in Germany, though they seem to have been little noted by the foreign press, a summing up of which at this time in connection with the true significance of the question should prove of interest in the United States. In the first postwar meeting of the Society of German Portland Cement Manufacturers, in the year 1919, K. Endell submitted a detailed report on tests with high alumina cements, which is all the more significant in that it covers the mineralogical identification of the ingredients as well as their chemical and mechanical properties. In the familiar ternary system — lime-silica-alumina, the field of portland cement is extraordinarily limited.

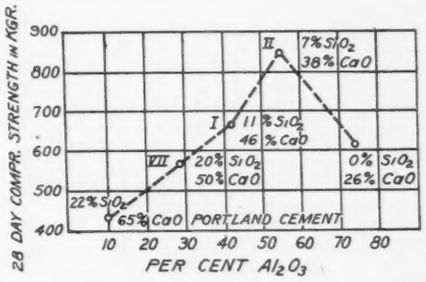


Fig. 3—The compressive strength increases with increase of alumina content until swelling begins

Of the multitude of possible combinations with the three ingrediants, few occur in actual cement. Their optical mineralogical identification is quite difficult, since their structure must be considered very minutely crystalline. It is desirable to extend investigation beyond the limited field of cement in order to determine whether combinations occur outside of the field with

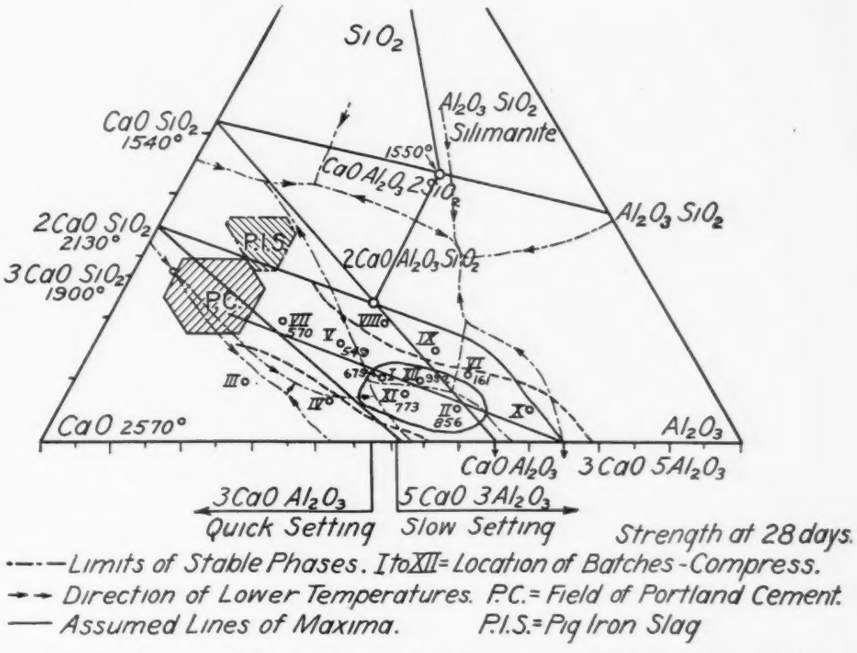


Fig. 2—Diagram of the 12 mixtures tested as given in Table I. The ellipse in the diagram marks the field of high alumina cements

TABLE I

Chemical Composition:	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
SiO_2	11.4	6.5	10.1	7.4	16.4	11.4	20.3	21.7	15.1	8.3	7.1	11.3
Al_2O_3	41.5	54.7	23.3	38.4	34.8	55.0	29.1	38.5	49.2	64.0	47.0	48.7
Fe_2O_3	0.6	1.3	0.2	0.4	0.5	0.4	0.7	1.2	1.1	0.6	1.8	1.4
CaO	46.1	37.1	62.8	53.0	48.4	32.6	50.2	38.7	35.0	27.0	44.2	39.4
MgO	0.6	0.6	0.5	0.5	0.6	0.5	0.2	0.4	0.3	0.2	0.3	0.4
SO_3	Trace	0.1	Trace	Trace	Trace	0.1	.....	.....	.....	.....	0.1	.....
S	.....	0.3	.....	.....	0.1	0.2	.....	.....	0.1	0.1	.....	0.1
Loss on ignition	.....	.....	2.8	.....	0.1	0.2	0.1	.....	.....	.....	0.2	.....
Total	100.2	100.6	99.7	99.7	100.9	100.4	100.6	100.5	100.8	100.2	100.7	101.3
Insoluble in HCl	0.5	2.3	0.4	0.5	0.3	1.1	2.6	2.3	1.4	3.9	0.5	0.2
Specific gravity	3.04	3.13	3.05	3.01	3.11	3.15	3.14	3.08	3.25	3.1	3.2	3.2
Initial set in hours and minutes	3h.15′	Quick	Instantaneous		4h.	3h.15′	2h.10′	Do not set		12h.20′	45′	6h.20′
Final set in hours and minutes	3h.55′	15′	.....	.....	8h.	16h.	3h.	.....	.....	20h.	1h.40′	8h.30′
Per cent of water used	23	50	50	50	27	29	31	.....	.....	20.5	26.5	23
Temperature increase	3.7°	50°	75°	75°	1.1°	0.5°	5.5°	.....	.....	0.5°	4.8°	0.9°
Boiling test	Yes	Yes	.....	.....	Yes	Yes	Yes	.....	.....	Yes	Yes	Yes
Compressive Strength:												
7 days water stored	484	646	No briquettes		305	55	382	No briquettes		146	610	672
28 days water stored	583	801	possible		422	168	474	possible		413	718	.....
28 days combined stored	655	856	.....	.....	519	161	570	.....	.....	311	773	952
Predominating mineralogical component	Calcium aluminate		Tricalcium aluminate		2CaO SiO_2	3CaO $5Al_2O_3$	2CaO SiO_2	2CaO Al_2O_3 $Si.O_2$	No crystals	3CaO $5Al_2O_3$	3CaO.Al_2O_3	
Behavior toward salt and $MgSO_4$ solutions	No reaction		.....	.....	No reaction		.....	.....	.....	No reaction		.....
Remarks	.....	.....	Not suitable		.....	.....	.....	Not suitable		.....	.....	.....

hydraulic properties — combinations whose constitution could be more readily determined on account of the coarser crystalline structure.

By the scaled diagrams of temperatures we know that the mixtures with the lowest melting points (1400 to 1500 deg. C.) are in the direction of the calcium aluminates, while combinations within the field of portland cements do not melt below 1800 deg. C. It was Endell's object to explore the possible hydraulic combinations between portland cement and the calcium aluminates and to define the area in which combination with hydraulic properties occur. For his experiments Endell used raw materials of great purity; sand with 99.8% silica, clay 95.3% aluminum and lime 99.4% calcium carbonate. A large furnace of the Technical High School at Berlin was used. Temperature measurements were made with optical pyrometer of Holburn-Kurlbaum. The carbon crucibles used showed no influence on the batches as the carbon content, computed as carbide, proved generally less than 0.3%. To remove all doubts, however, ½ to 1% of calcium carbide was added to a standard portland cement to observe its action on the cement. It was found that the carbide in no wise affected the strength of the cement and only slightly hastened the initial set.

Altogether 12 batches were produced of combinations between the field of cement and the lime aluminates. Basing on the results of American research they were all confined to certain stable phases. These are given in Table I.

Disregarding the slight chemical impurity of the materials the following combinations were to be expected: in batches III and IV ($3CaOAl_2O_3$), in batches I, II, XI and XII ($CaOAl_2O_3$) in batches VI and X ($3CaO5Al_2O_3SiO_2$). The composition of

TABLE II

					—In Proportion—		
					Silicate	Aluminate	Alumina
I	100 T	5CaO $2SiO_2$	+	8.65 ($3CaO Al_2O_3$)	= 92.04	7.96	3.00
II	100 "	"	+	18.80 "	= 84.18	15.82	6.00
III	100 "		+	31.00 "	= 76.34	23.66	9.00
IV	100 "	"	+	50.00 "	= 66.67	33.33	12.60
V	100 "	"	+	75.00 "	= 57.14	42.86	16.18
VI	100 "	"	+	100.00 "	= 50.00	50.00	18.89
VII	75 "	"	+	100.00 "	= 42.86	**57.14**	**21.59**
VIII	50 "	"	+	100.00 "	= 33.33	66.67	25.19

those batches appears from their location on the diagram marked Fig. 2.

The material, well mixed and passed through a screen of 900 meshes per sq. cm. was heated several hours at a temperature of 1500 to 1600 deg. C. The crucibles were then removed and emptied into iron forms in which the molten mass quickly congea'ed. In order to produce 5 to 6 kg., 8 to 10 batches were generally required. The results of the chemical and mechanical examination of the 12 batches is given in Table I.

The foregoing table requires no further explanations but attention is called to the high compressive strengths of batches II, XI and XII after 28 days' combined storage.

In agreement with the findings of Bied and Spackman these high alumina cements showed remarkable resistance both to 15% solutions of common salt and 12% solutions of magnesium sulphate.

Besides the double compound gehlinite ($2CaOAl_2O_3SiO_2$) the following forms of calcium aluminate were determined by microscopic examination:

Tri-calcium aluminates, $3CaOAl_2O_3$.
Penta-calcium tri-aluminate $5CaO3Al_2O_3$.
Calcium aluminate $CaO.Al_2O_3$.
Tri-penta-aluminate $3CaO5Al_2O_3$.

The results of tests have shown that in the ternary system, combinations do occur outside of the field of portland cement, to which hydraulic properties must be ascribed, and the field of these high alumina cements confines itself to the area marked by an ellipse in Fig. 2. It seems specially noteworthy that the compressive strengths of alumina cements are higher than those of the calcium aluminates, for which Killig had obtained values up to 610 kg. per sq. cm. in 1913. That the compressive strength depends to a certain extent on the alumina content appears from Fig. 3.

The batches with the highest compressive strength as to their chemical composition vary between the following limits:

	Alumina cements	"Cement Fondu"
SiO_2	5-15%	10-12%
Al_2O_3	45-60%	40-45%
CaO	35-45%	35-40%

Bearing in mind the foregoing results it is clear that tri-calcium aluminate cannot occur in any considerable quantities in any hydraulic binders and also that the double compound gehlinite disappears.

In the year 1921 Dr. Schott of the Heidelberg cement works made known the results of his own tests with high alumina cement, in which he used the well-known formula of Jaenecke as a basis ($8CaO.2SiO_2.Al_2O_3$) but which he divided as follows: $5CaO + 2SiO_2 + 3CaOAl_2O_3$. The Jaenecke formula has been vigorously opposed by the co-workers of the Geophysical Laboratory at Washington. The mixtures which were produced and computed in each case for the calcined form are given in Table II at the head of this column.

Furthermore, in order to determine the limits at which the cement would swell, out

TABLE III

	1			2			3			4			5			6		
	CaO	SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3
I	69.46	27.54	3.00	69.76	27.27	2.97	70.06	27.00	2.94	70.35	26.83	2.91	70.63	26.50	2.88	70.91	26.23	2.86	71.19	25.98	2.83
II	68.77	25.23	6.00	69.08	24.98	5.94	69.38	24.73	5.88	69.68	24.50	5.82	69.97	24.26	5.77	70.26	24.03	5.71	70.54	23.80	5.66
III	68.10	22.90	9.00	68.42	22.67	8.91	68.73	22.45	8.82	69.03	22.23	8.74	69.33	22.02	8.65	69.62	21.81	8.57	69.90	21.60	8.49
IV	67.40	20.00	12.60	67.72	19.80	12.48	68.04	19.61	12.35	68.35	19.42	12.23	68.65	19.23	12.12	68.95	19.05	12.00	69.25	18.87	11.88
V	66.68	17.14	16.18	67.01	16.97	16.02	67.34	16.80	15.86	67.76	16.64	15.70	67.96	16.48	15.56	68.27	16.32	15.41	68.57	16.17	15.26
VI	66.11	15.00	18.89	66.45	14.85	18.70	66.77	14.71	18.52	67.10	14.56	18.34	67.41	14.42	18.16	67.72	14.28	18.00	68.03	14.15	17.82
VII	65.55	12.86	21.59	65.89	12.73	21.38	66.22	12.61	21.17	66.55	12.49	20.96	66.86	12.37	20.76	67.19	12.25	20.56	67.50	12.13	20.37
VIII	64.81	10.00	25.19	65.16	9.90	24.94	65.50	9.80	24.70	65.83	9.71	24.46	66.11	9.62	24.22	66.49	9.52	23.99	66.80	9.44	23.76

of each of the eight mixtures seven batches were made to which 1.78% limestone had been added. In burning to sinter heat the following temperatures were noted:

No.		No.		Difference
I	1750 deg. C.	I-6	1950 deg. C.	200 deg. C.
II	1720 deg. C.	II-6	1900 deg. C.	180 deg. C.
III	1575 deg. C.	III-6	1880 deg. C.	305 deg. C.
IV	1530 deg. C.	IV-6	1780 deg. C.	250 deg. C.
V	1500 deg. C.	V-6	1650 deg. C.	150 deg. C.
VI	1460 deg. C.	VI-6	1620 deg. C.	160 deg. C.
VII	1430 deg. C.	VII-6	1600 deg. C.	170 deg. C.
VIII	1410 deg. C.	VIII-6	1560 deg. C.	150 deg. C.

According to the formula of Jaenecke two mixtures had been produced which contained $5CaO2SiO_2$ and $3CaOAl_2O_3$. Proceeding from these two mixtures with increasing alumina content developed then by successive increases of lime content six further combinations of each of these so that 8 times 7 combinations resulted with increasing alumina content and increasing percentage of lime. The composition of these 56 cements is given in Table III on the foregoing page.

It is apparent from the temperatures given above that with addition of lime, the sinter temperature becomes higher. Looking at the rows of figures the remarkable fact is evident that with the increase in basic tri-calcium compounds, the percentage of lime decreases instead of increasing. This apparent contradiction is conditioned on the higher atomic weight of aluminum as against that of silicon. For the production of high alumina cements it is concluded from this, that they should be kept lower in lime content.

The mineralogical examination of the cements by Dr Schott was conducted by Dr. Kratzert, assistant at the mineralogical institute at Heidelberg. In the thin sections of the clinker, among disarranged particles, showing refraction and double refraction, there appeared small granules of still stronger simple (isotrop) refraction granules, such as are also characteristic of tri-calcium aluminate. Furthermore it was found that the number of these granules increases with the increase in aluminate in question. The clinker of tri-calcium aluminate proves to be strongly refractive but weakly doubly refractive.

The alumina cements to a great extent were shown to be sound. Attempts to determine the quantities of water absorbed in hydrating did not succeed because, on stopping the shaking, the cements set over night. In the process the high alumina cements expanded to several times their original volume. As the quantities at his disposal were not very great Dr. Schott could finally mix two or three briquettes from each sample and these briquettes he reduced to 3 cm. However, the following results were attained, given in Table IV, on this page.

From these compressive strengths it is evident that they increase with the line content to a point at which swelling begins with too high content of tri-calcium compounds. The first strengths increase with the alumina content, but too much alumina brings about a tendency to check, due to previous swelling.

TABLE IV

Alumina Cements and Compressive Strengths

	3 days	7 days	28 days	28 days Combined
	kg.	kg.	kg.	kg.
I	22.0	44.4	161.1	194.4
I1	24.4	44.4	138.8	172.2
I2	32.8	50.0	133.8	166.6
I3	44.4	72.2	161.1	200.0
I4	161.1	222.2	344.4	444.4
I5	177.7	277.7	516.6	450.0
I6	188.8	200.0	388.8	383.8
II	44.4	52.8	188.8	216.6
II1	37.7	44.4	155.5	150.0
II2	44.4	52.8	122.2	177.7
II3	72.2	52.8	188.8	227.7
II4	119.4	222.5	361.6	516.6
115	194.4	272.2	466.6	522.2
116	333.3	494.4	527.7	538.8
III	44.4	77.7	261.1	244.4
III1	55.5	83.3	288.8	233.3
III2	44.4	66.6	227.7	200.0
III3	55.5	72.2	355.5	311.1
III4	305.5	416.6	544.4	600.0
III5	322.2	366.6	483.3	583.3
III6	333.3	333.3	372.2	544.4
IV	.....	.....	.....	.....
IV1	.....	.....	.....	.....
IV2	22.2	77.7	222.2	192.0
IV3	38.8	244.0	366.6	455.5
IV4	233.3	305.5	427.7	527.7
IV5	166.6	322.2	322.2	516.6
IV6	188.8	266.6	336.0	444.4
V	105.5	388.3	411.1	511.5
V1	61.1	377.7	455.5	511.1
V2	144.4	444.4	455.5	594.4
V3	124.2	388.8	488.8	522.2
V4	192.2	238.8	333.3	511.1
V5	177.7	194.4	288.8	444.4
V6	222.2	233.3	416.6	533.3
VI	244.4	333.3	416.6	430.3
VI1	219.4	236.1	344.4	350.0
VI2	155.5	305.0	411.1	361.6
VI3	222.2	305.5	383.3	522.2
VI4	211.1	211.1	300.0	422.0
VI5	205.5	166.6	244.4	311.1
VI6	166.6	211.1	266.6	288.8
VII	194.4	211.1	300.0	433.3
VII1	166.6	261.1	333.3	427.7
VII2	222.2	222.2	255.5	411.1
VII3	244.4	300.0	338.8	566.6
VII4	111.1	155.5	222.2	300.0
VII5	138.8	127.7	244.4	350.0
VII6	127.7	122.2	244.4	366.0
VIII	233.3	272.2	316.6	483.0
VIII1	255.5	244.4	322.2	450.0
VIII2	244.4	300.0	339.3	511.1
VIII3	222.2	277.7	322.1	522.2
VIII4	155.5	166.6	166.5	366.5
VIII5	132.0	155.4	177.8	250.0
VIII6	122.2	161.1	166.6	238.8

Also the investigations of Dr. Schott confirm, quite independently, not only those of Endell, but also the results attained by French and American research on the subject, especially in connection with the manufacture of cement fondu. The compressive strengths which Dr. Schott attained are on the whole, not so high as those obtained by Endell and foreign investigators, but as the number of test pieces was comparatively small and the percentage of alumina did not nearly reach that of cement fondu, the early hardening was very much less.

On the other hand, through the work of Endell and Schott, the inconsiderable afterhardening of alumina cements can be understood. Cement fondu, for instance, reaches a strength of 352 kg. per sq. cm. in 24 hours, but after 28 days has increased to only 475 kg. This latter compressive strength, however, is greatly exceeded by many portland cements used in the same proportion (1 to 3). In estimating the value of alumina cements it is therefore of the greatest importance to determine whether they do weaken with age, making their quick-hardening qualities an illusion.

Columbia Cement Co. to Develop Large Mineral Holdings in California

DEVELOPMENT of one of the largest single deposits of marble, limestone, clay and silica sand in the world—8900 acres of it north and west, a few miles of Coyote Wells, Imperial county, California, along with 2420 acres of limestone and clay properties near Huntington, Baker county, Oregon, has been announced in Los Angeles by executives of the Columbia Cement Co., a $6,000,000 Nevada corporation just reorganized to operate the holdings.

These plans set forth that five plants for the manufacture of white cement, gray cement, glass, tile and for the working of marble are to be built at an approximate cost of $3,000,000 at either National City, San Diego Bay, or near the Coyote Wells property on the San Diego and Arizona railroad. A $1,470,000 works on the Huntington (Oregon) holdings is about to start operation. Nearly $5,000,000 will have been invested in the Columbia Cement Co.'s plants and equipment on the completion of the present program. Specifications for the southern California units are being drawn.

The Columbia Cement Co. was formed by Fred A. Ballin, president, until recently head of the Monolith Portland Cement Co. of Los Angeles and San Francisco, when he disposed of his interests to purchase the Huntington property. The Columbia's capitalization has been increased from $2,000,000 to $6,000,000 to permit taking over of the Coyote Wells deposits.—*Los Angeles Times.*

Railroads Ask Rehearing on Arizona Gypsum Rates

APPLICATION for a rehearing on the decision of the Arizona corporation commission in ordering a reduction of approximately 40% in rates charged by carriers for hauling products of the Arizona Gypsum Plaster Co. of Douglas, Ariz., was filed before the commission on behalf of the El Paso and Southwestern recently.

The application alleges that the commission was without authority to hold that rates charged the Douglas company by the carriers were unjustly high and discrimatory. The commission's ruling in the matter was handed down July 12 of this year.

The original application of the gypsum company for relief was brought against the Arizona Eastern and others including the El Paso and Southwestern.—*Bisbee (Ariz.) Ore.*

Buying Coal

THE Steam Coal Buyer and Salesman is a pamphlet issued by the *National Coal Mining News*, Charleston, W. Va. (Price 50c.) It is mainly a collection of analyses of the various coals of the United States.

New Tennessee Rock Phosphate Plant

Ridley Phosphate Company of Mount Pleasant Builds New Washer and Prepares for Large Tonnage Production

[EDITORIAL NOTE: Under date of August 28, the Ridley Phosphate Co. writes that it expects the new plant to begin production about the middle of September. This is one of the many indications that conditions are bettering in the phosphate rock industry. The following article was written in April when construction of the plant had not progressed far and when it took faith and courage on the part of the builders to invest their money in such an enterprise.]

THROUGHOUT the Tennessee brown rock phosphate field producers have been curtailing production or shutting down their plants altogether, the low price of agricultural products having played havoc with the demand for fertilizer. Prices today are somewhat better than they were and some plants can go on producing, recovering something more than the actual operating costs, if one does not count overhead and depletion and depreciation as a part of such cost.

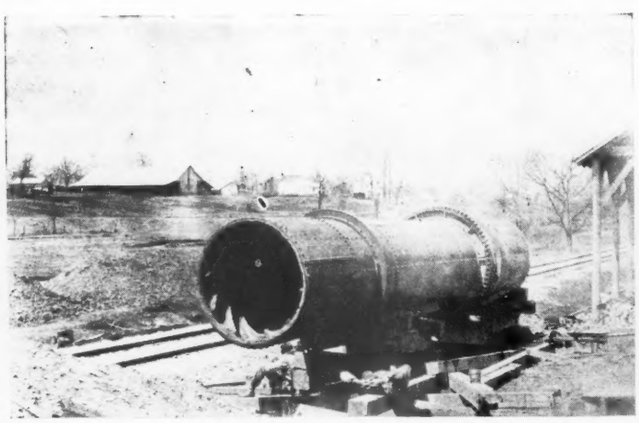
Under such circumstances it is indeed surprising to find a new washing plant being built in this field. One would say at first sight that the promoters were brave to the point of foolhardiness. But the men who compose the Ridley Phosphate Co. of Mount Pleasant, Tenn., have been in the phosphate business for a good many years and they did not begin the building of this plant without a very thorough study of the situation and a good idea of where they would land before they took the jump.

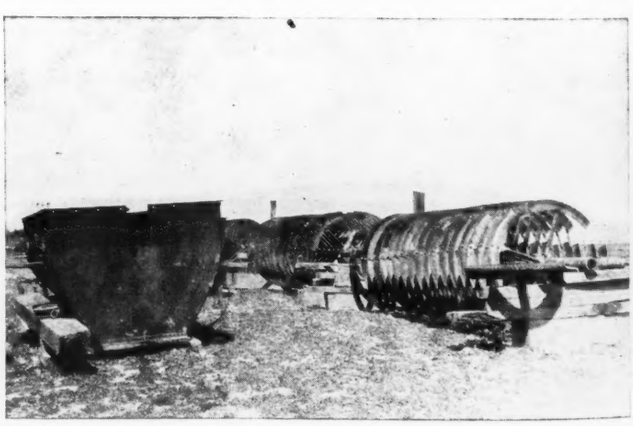
The story begins with the finding of a big phosphate deposit on the Ridley farm between Mount Pleasant and Columbia, a deposit which it is said will compare favorably with any that has been discovered in this field. The remarkable thing is that it could have been there undiscovered through all these years, for the country around Mount Pleasant and Columbia is as full of prospect holes as the vicinity of a Colorado mining camp. It so happens, however, that a ridge divides this deposit from the rich portion of the Mount Pleasant field in which so much work has been done, and this ridge contains little or no phosphate. One might hazard a guess of a fold dividing this part from the main field. Anyway, the presence of good phosphate rock was unsuspected, although specimens of good "plate rock" may be seen in many a plow furrow on the land. And this in a country where every boy knows "rock" when he sees it by the time he is 5 years old!

The deposit is said to underlie some 1500 acres of the big Ridley farm. In some places it is almost at the top of the ground, in others there is 3 to 6 ft. of stripping needed to uncover it. It lies on the usual rough limestone bottom with deep "cutters" in which the phosphate rock may go 12 or 15 ft. below the usual level. But the remarkable thing about it is the high percentage of lump rock. The company estimates the "lump" to be 60% of the whole, and this estimate, to one who has examined the ground, appears conservative.

"Lump rock" is very much preferred by the buyers of phosphate rock for reasons not altogether clear. It is apt to be of higher grade, which explains it in part. The "lump" from this deposit runs from 75% to 78% B.P.L. But even where the grade is the same it seems to be preferred, especially if it is kiln dried or sun dried. Even at the present low prices there is something to be made by hand mining "lump" and drying it on kilns in the good old way before

The new plant under construction as it appeared last spring





Left—Dryer to be installed in new washing plant. Right—Aikens classifiers. These are used to dewater the phosphate sands that have been scrubbed free from clay in the jet tanks

shipping to the fertilizer makers.

The Ridley Phosphate Co. has been hand mining and kiln drying "lump" from this deposit for something like a year now, and has found it profitable. No machinery has been employed except a small Bucyrus dragline excavator which has been used for doing a part of the stripping. The "muck" as mined is hand screened over a 2-in. wire screen to separate the "lump" which is hauled to the kiln sheds by mules and wagons.

Mining and screening "lump rock" by hand. About 50% of the material mined is recovered as "coarse lump"

For this operation the company has erected two large and well-built kiln sheds and have put in a spur track from the L. & N. railroad. It is interesting to note that this spur track is ballasted with Alabama slag, although there is plenty of lime rock handy, even on the property, where it has been exposed in mining. But without a crusher the slag was cheaper.

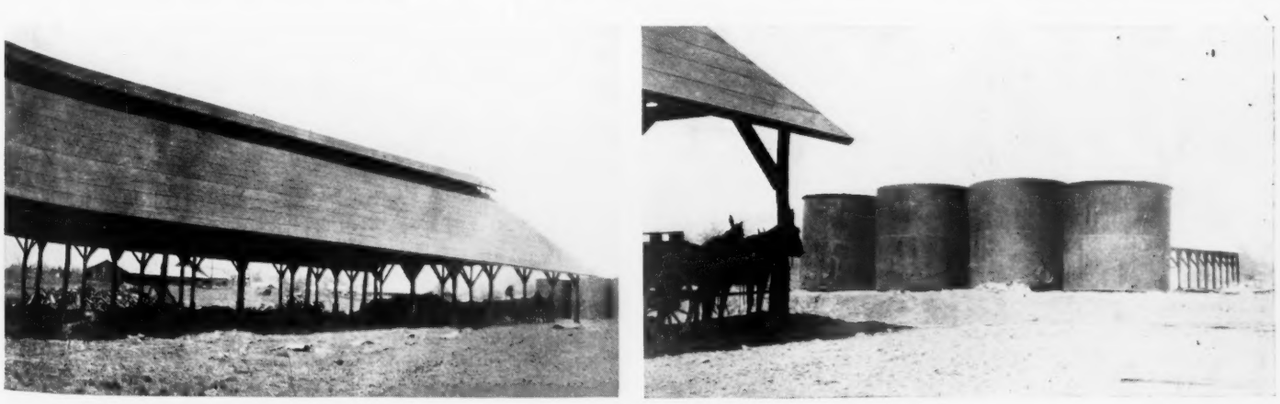
About half of the material mined remains on the 2-in. screen and is sent to the kilns. The remainder is known locally as "throw backs" and it is a mixture of "fine lump," phosphatic sands and clay. This portion of the deposit has to be washed free from clay to render it marketable.

Already a pile of several thousand tons of this material has accumulated from the present operations and more is coming every day. It is to treat this and to simplify the whole operation that the washer is being erected, for without it there will be a steady accumulation of "deferred profits" in the pile of "throw backs." With hand mining and kiln drying of "lump rock" as profitable as it is, it may be seen that the erection of a washing plant may be justified, even in such times as these.

Hand mining will be continued after the plant is started, but the "muck" will not be hand screened. It will all be sent to the plant where it will be washed over a 22 ft. by 60-in. Allis-Chalmers revolving screen to remove the coarse "lump." This oversize of this screen will be sent to the kilns without further treatment. The undersize (minus 2-in.) will go to two McLanahan-Stone Machinery Co. 25 ft. log washers. The function of these is to break up any clay balls that may be present and to give the sand and fine lump a thorough scrubbing. From the log washers the material will go to a ½-in. screen, where the "fine lump" will be separated from the "sand." The first goes to the dry kilns with the "coarse lump" and the second to the jet tanks.

These jet tanks are much used in this field for the scrubbing and washing of fine material. The jet is a hydraulic ejector working on the same principle as the injector that is used to feed a boiler, but employing a jet of water instead of steam to do the work. The jet is an elevator and at the same time a good scrubber which helps to free the sandy grains from the film of clay they carry. Each tank has an overflow, the excess water

Showing how a kiln is built of wood and "lump rock." Note ends of cordwood sticks on the right



Left—Kiln sheds in which the lump rock is dried by burning with wood that is built into the kiln. The shed is to keep the dried rock from being wet by rain. Right—Jet tanks. A jet (hydraulic ejector) will be installed in each of these and the tanks will be placed in series. The jet passes the material from one tank to another, scrubbing it free from clay

introduced by the jets being disposed of in this way. A part of the clay is thus removed by dilution and overflow.

The jet tanks are in series. From the last tank the jet sends the sand to five Aikins classifiers, made by the Colorado

C. W. Alexander

Iron Works. These classifiers consist of a large diameter ribbon-type screw conveyor working in a trough which has a slight incline. The sand is dragged up the incline by the screw and discharged in a dewatered condition at the upper end. The clayey water overflows at the lower end.

The plant represents what may be called the conservative practice of the field, the design and all of the machines having stood the test of years of service in this locality. The washer should have a large capacity owing to the nature of the de-

J. T. Jenkins

posit. About 50% will be taken off at the first screen and 10 to 15% more at the second screen, leaving only 35 to 40% in the sand. It is the proportion of sand (and accompanying clay) in the deposit that determines the capacity of the washer and in this deposit the proportion is low.

The plant is being built cheaply, as much of the material has been salvaged from plants that stood upon exhausted deposits in the field. A case in point is the sand dryer of the rotary type, the particular form being one that has been developed locally.

The company is composed of C. W. Alexander, J T. Jenkins and G. W. Killebrew. All three have been connected with the mining and shipping of phosphate rock for about as long as the Mount Pleasant fields have been open. The office of the company is at Mount Pleasant, Tenn.

What Happens When Dynamite Explodes?

By CHARLES S. HURTER
With E. I. Du Pont de Nemours & Co.

BIG dynamite blasts are more and more frequent items of news. Charges of dynamite are buried deep in the face of a cliff, an electric switch is turned, there is a deafening roar, and thousands of tons of rock come crashing down. What, the inquiring observer asks, produces this explosion? What actually happens when dynamite explodes?

To answer this question it is necessary to explain briefly what dynamite is. Reduced to its essentials, dynamite is a mixture of nitroglycerin with wood meal and nitrate of soda or nitrate of ammonia, or both. Nitroglycerin, in turn, is composed of several different elements, namely, carbon, hydrogen, nitrogen, and oxygen, the molecules of which are grouped in such a way as to form a heavy, oily, yellow liquid. Now these same molecules are capable of arrangement in other groups to form several different substances instead of the one, and the bonds which hold them together in the particular arrangement which makes nitroglycerin are very weak.

Consequently, when the electric current sets off the detonator imbedded in the dynamite and this imparts a sharp shock and very high temperature to the nitroglycerin, the bonds between the molecules which compose the nitroglycerin break down. The nitrogen and some of the oxygen remain free—both of them, gases—while the other molecules instantly combine to form two compound gases, carbon dioxide and water vapor. The breaking down of the nitroglycerin and rearrangement of its molecules generates a great deal of heat—enough to raise the temperature of the gases to 6300 deg. F. or thereabouts—and this high temperature causes the other ingredients of the dynamite to decompose into gases, or to burn, with the release of still more heat. All of this takes place in a single instant and the highly heated and rapidly expanding gases, which would normally occupy a much greater volume than the dynamite, exert a sudden tremendous pressure on the walls of the bore hole. The rock gives way and the escaping gases set the air into violent vibration. To the beholder, the explosion consists of the roaring noise and the rending of the rock, but in reality these are only the audible and visible results of the rearrangement of the molecules of the dynamite when subjected to a shock from the detonator, this conversion of the nitroglycerin and other ingredients of the dynamite into gases constituting the actual explosion.

Fatal Explosion in Pulverized Coal Bin

[The following is a fair illustration of how ignorance of primary physical and chemical laws may bring about a fatal accident. The stirring up of burning pulverized coal with a jet of compressed air was just as certain to cause an explosion as the dropping of a lighted match in a barrel of powder would be.—Ed.]

WILLIAM H. PRICE, age 32, who lived about five miles northeast of Greencastle, was fatally burned and R. E. Mathew, 1022 S. College avenue, was perhaps fatally burned in an explosion in a coal bin at the Indiana Portland Cement plant at Limedale.

The two men were employed as burners, their duties keeping them in the coal bin. A fire had been burning in the powdered coal in the bin. The fire was almost extinguished when the men turned streams of compressed air into the bin in an attempt to clean it out.

The compressed air stirred up coal dust which ignited from the smoldering fire and caused a terrific explosion. The top of the bin was blown off.

Pacific Portland Cement Co. Opens Plant with Visitors' Day and Banquet

THE *Tribune* of Redwood City, Calif., where the new plant of the Pacific Portland Cement Co., Consolidated, is located, describes the "formal opening" of the plant as follows:

"Between 4000 and 5000 people yesterday availed themselves of the opportunity of inspecting the huge $2,000,000 plant of the cement company, a continuous flood of visitors filing through the big buildings of the plant throughout the visiting hours. The crowds far exceeded anything that had been anticipated, either by officials of the company or by the directors of the local chamber of commerce, which aided in fostering plans for the formal opening.

"B. F. Hudspeth of the engineering staff of the Pacific Portland Cement Co., Consolidated, was on duty throughout the day yesterday as personal guide, explaining the workings of the cement mill to the hundreds of visitors."

A banquet was given by the Chamber of Commerce of Redwood City in the evening at which the officials of the company were introduced to local civic leaders and prominent citizens.

A Compact Hydrate Plant

New Lime Plant of John Herzog and Son, Forest, Ohio, Now in Production—Compactness and Simplicity Featured Throughout

By Charles A. Breskin

IN the December 29, 1923 issue of ROCK PRODUCTS there appeared a complete description of the new lime burning plant constructed for John Herzog and Son of Forest, Ohio. This was one of the feature lime burning units constructed that year and was of especial interest because of the many labor-saving units installed.

Briefly, the lime burning plant consists of six Arnold kilns, 11 ft. in diameter and 46 ft. high. Stone is charged into the kilns by a pivoted bucket carrier that extends the entire length of the plant. This same carrier is also used to receive the burnt lime and to carry it to the lump lime storage.

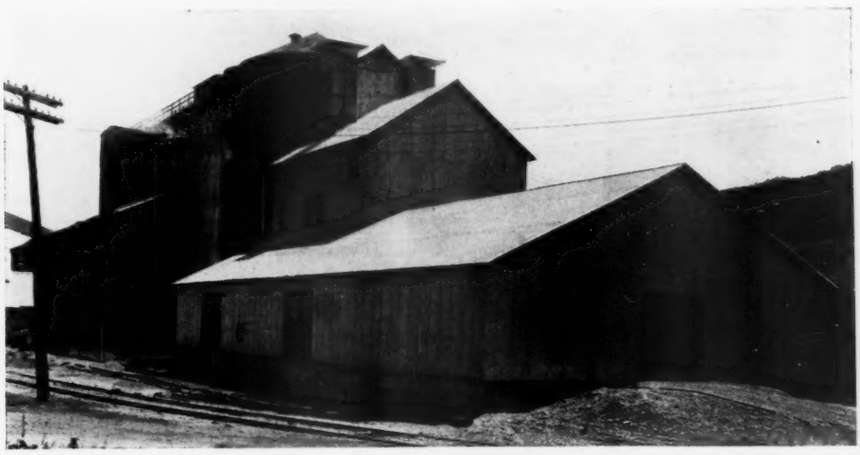
An important feature is the method of drawing lime. The old rack and pinion has given way to the pneumatically operated draw shears. In this plant the shears on all the coolers are operated from one double-acting Curtis air cylinder. Some of the accompanying illustrations show the air cylinder and the operating mechanism.

The lump lime is stored in a concrete tank of 70 tons capacity. It is drawn out of this by a Webster shuttle feeder and delivered to a No. S-5 Pennsylvania hammer mill run by a 75-hp. Westinghouse motor. The pulverized lime is reclaimed by a bucket elevator and discharged over an inclined vibrating screen located directly over the ground lime storage tank. This tank has 300 tons capacity and is divided in two parts. Underneath each half of the tank is a screw conveyor into which the lime is drawn from the tank. These screw conveyors work separately or together, and discharge to one common elevator boot. From here the lime is elevated to the hydrate lime hopper or is diverted to spouts for car loading.

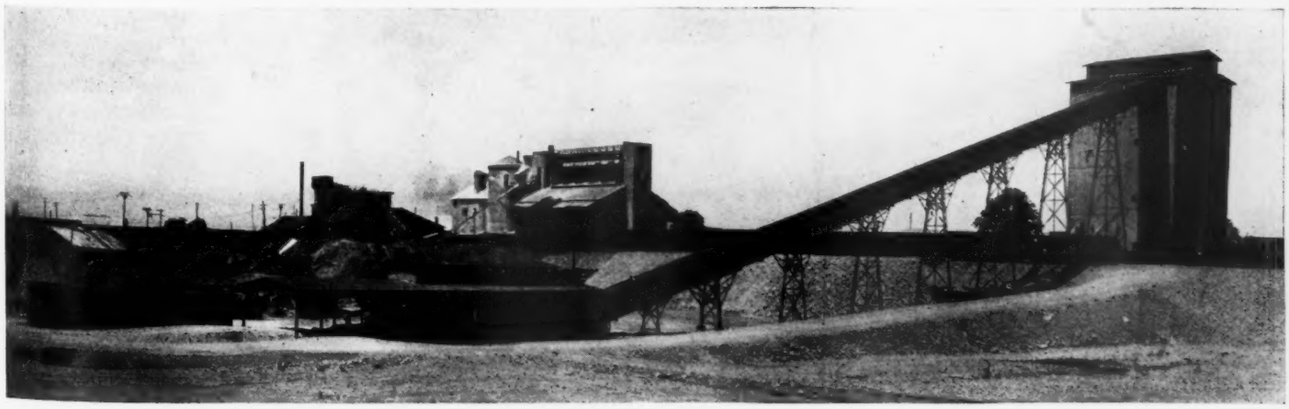
The hydrate lime hopper has a capacity for one ton and serves as a weigh hopper for the hydrators which are located immediately underneath it. These are two Clyde hydrators of the latest type and they are worked alternately so that in effect this plant has continuous hydration of lime. Both hydrators discharge into an 8-ton hopper located above an 18-in. Bonnot mill, driven by a 25-hp. motor. The discharge from the Bonnot is reclaimed by a bucket elevator and delivered to a 25-ton finish-bin ahead of a Bates 4-valve bagging machine. From here the lime is trucked directly into cars or into storage. A loading track is on both sides of the plant. There is storage capacity for over 30 cars of lime. The lime is marketed under the trade names of Capitol Finishing Hydrate and Capitol Mason's Hydrate.

The Herzog company furnishes considerable ground lime for glass manufacture.

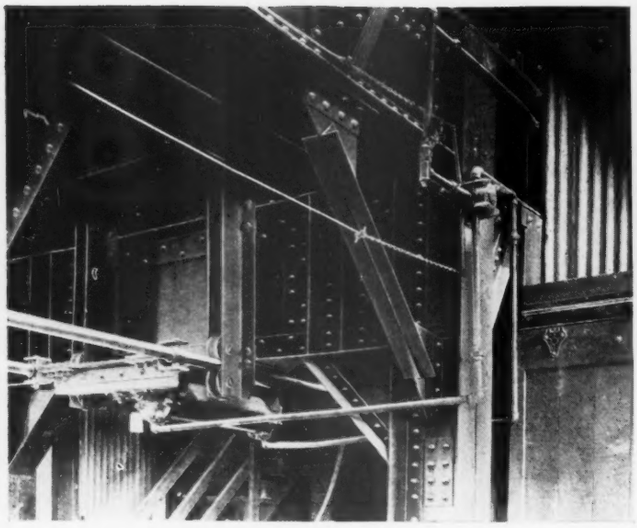
The hydrate building is light and airy, is constructed of steel and covered with Armco roofing and siding throughout. The entire plant is simple and compact—everything laid out in a straight line and easily accessible to repair. The installation is such that the capacity of the plant can be doubled or trebled without interfering with the present plant. It is planned to have 21 kilns installed.

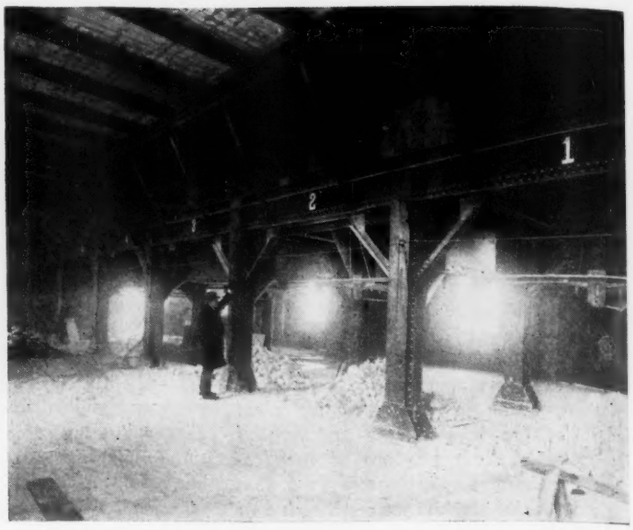


Hydrate and lime burning plant. Cars are loaded on either side of the store room

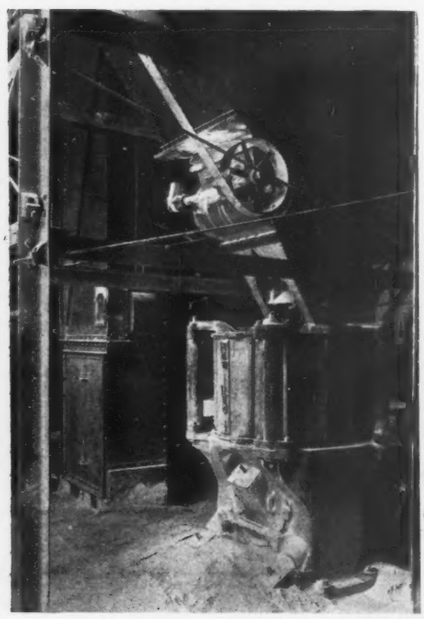


Plant of John Herzog and Son, Forest, Ohio. Crushing plant (in front) has only one crushing unit. Note stone storage near kilns

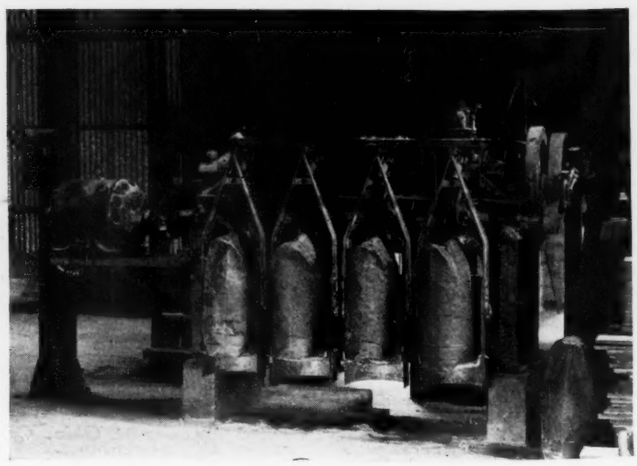




Left—Air cylinder that operates draw shears on all the kilns. Pipe lines run on either side of the kilns. Cylinder piston is attached to the pipe lines by a cross-piece. Right—Method of operating the draw shears. It is only necessary to insert a cross-bar between the pipe lines and pull open the valve. The pivoted bucket carrier runs underneath the coolers

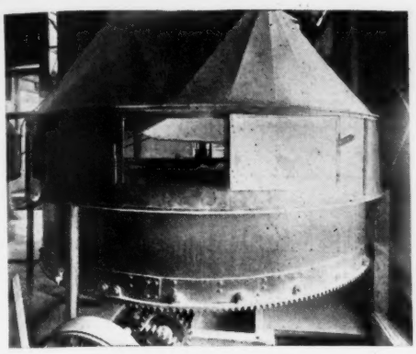


Left—An 18-in. pulverizing mill for hydrated lime. Right—The firing floor showing how coal is delivered in easy reach from the kilns

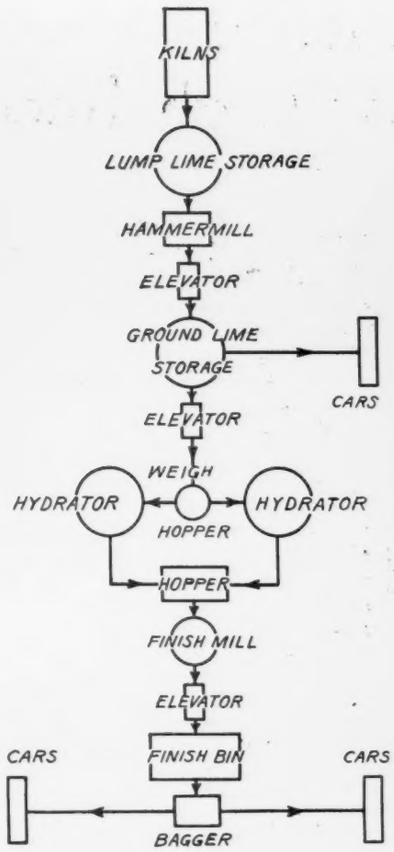


Left—Twin screw conveyors draw the lime from ground lime storage. Right—Bagging machine. Space has been left for installing another

A feature of this plant that has been operating very successfully since the plant was put into production is the method of delivering coal to the firing floor of the kilns. The firing floor on either side of the kilns is offset 8 ft. from the main building. This allows space for railroad tracks adjacent to the plant, and coal is put on the firing floor with a locomotive crane. The sloping roof of the building is fitted with sliding doors that run on cast-iron wheels which have roller bearings. The doors are covered with metal sheeting and suitably counterweighted so that if coal is needed at any kiln it is only necessary to raise a door. This method of handling coal and the method of charging the kilns, as well as drawing the lime, have made for a minimum amount of labor.

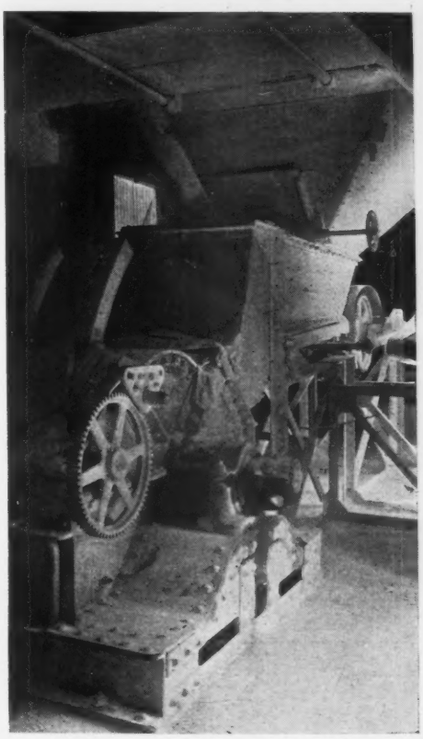


Two hydrators worked alternately give a continuous flow of hydrated lime



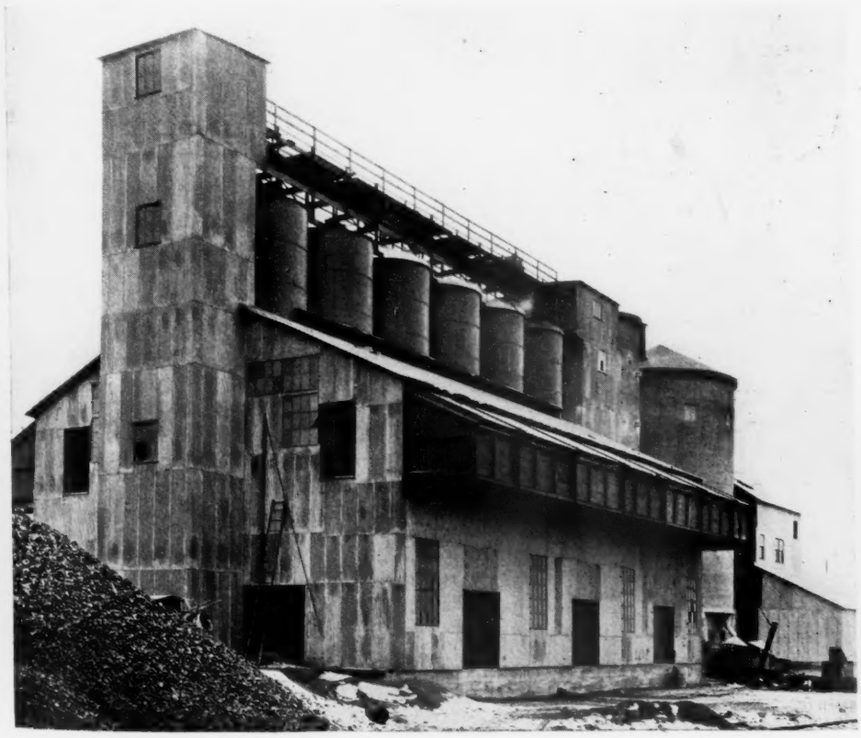
Flow sheet of hydrating plant

The kilns and the entire lime burning plant as well as the pneumatic draw shear mechanism were designed by Arnold and Weigel of Woodville, Ohio; the hydrators, by H. Miscampbell, Duluth, Minn.; elevators and conveyors, Webster Manufacturing Co., Chicago, Ill.; steel fabrication by the Massillon Bridge and Structural Co., Massillon, Ohio. The shear mechanism was originated by Arnold and Weigel and is of their own special design.



Crusher which pulverizes all burned lime

Bert Herzog is general manager of the plant. His father, John Herzog, while not officially active, takes quite an interest in all the operations.



The lime burning unit. A pivoted bucket carrier delivers stone to the kilns and also delivers burned lime to storage. Note extension to building for coal handling on firing floor

California Portland Cement Co. Builds New Type of Tank

THE current number of *Engineering News-Record* describes a new type of water tank built by the California Portland Cement Co. at its plant at Colton, Calif. The tank is of reinforced concrete, but the reinforcing is only nominal so far as the steel embedded in the concrete is concerned. For resisting the pressure of the contained water the tank was hooped on the outside as a wooden tank would be. These hoops were of 29/32 steel rod fitted with turnbuckles and were tightened to about 12,500 lb. per square inch before the tank was filled. The pressure of the water brought the tension in the steel to 16,000 lb. per square inch, but there was no tensile stress in the concrete.

Crushed limestone and limestone screenings were used for the concrete.

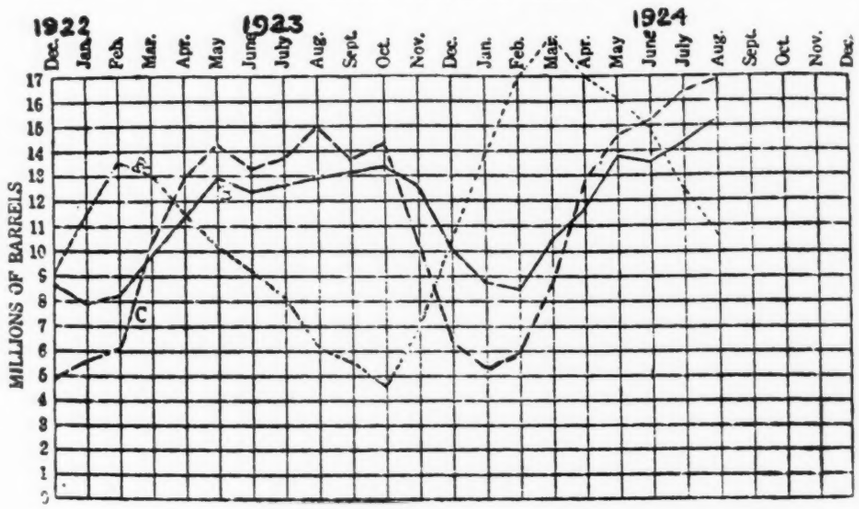
Portland Cement Production Makes a New High Record

THE statistics shown in the following tables issued by the Department of the Interior, and prepared under the direction of Ernest F. Burchard, of the Geological Survey, are based mainly on reports of producers of portland cement but in part on estimates. The estimates for August, 1924, were made necessary by the lack of returns from two plants. Production and shipments for the month once more made a new high record. Stocks were higher than at any corresponding period since 1917.

Stocks of clinker, or unground cement, at the mills at the end of August, 1924, amounted to about 5,355,000 bbl., compared with 6,646,000 bbl. (revised) at the beginning of the month.

The Bureau of Foreign and Domestic Commerce of the Department of Commerce reports that the imports of hydraulic cement in July, 1924, amounted to 109,098 bbl., valued at $181,470. The total imports in 1923 amounted to 1,678,636 bbl., valued at $2,964,098.

MONTHLY FLUCTUATIONS IN PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT



(A) Stocks of finished portland cement at factories. (B) Production of finished portland cement. (C) Shipments of finished portland cement from factories

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN AUGUST, 1923 AND 1924, AND STOCKS IN JULY, 1924, IN BARRELS

Commercial district	Production—August 1923	Production—August 1924	Shipments—August 1923	Shipments—August 1924	Stocks at end of August 1923	Stocks at end of August 1924	Stocks at end of July, 1924*
Eastern Penn., N. J. & Md.	3,388,000	3,621,000	4,084,000	4,263.000	2,118,000	2,092,000	2,734,000
New York	720,000	803,000	823,000	942,000	552,000	645,000	784,000
Ohio, Western Penn. & W. Va.	1,295,000	1,707,000	1,606,000	1,882,000	469,000	1,018.000	1,193,000
Michigan	646,000	1,105,000	788,000	1,175,000	185,000	459,000	528,000
Wis.,† Ill., Ind. & Ky.	2,008,000	2,133,000	2,080,000	2.529,000	428,000	1,554,000	1,950,000
Va., Tenn., Ala. & Ga.	681,000	1,049,000	684,000	1,241,000	231,000	414,000	606,000
E'n Mo., Ia. & Minn.	1,268,000	1,596,000	1,620,000	1,660,000	662,000	2,046 000	2,110,000
Western Mo., Neb., Kans. & Okla.	1,026,000	1,033,000	1,254,000	1,036,000	645.000	1,134,000	1,137,000
Texas	385,000	414,000	413,000	433,000	159,000	245,000	264,000
Colo. & Utah	231,000	283,000	275.000	259,000	113,000	191,000	167,000
California	1,009,000	1,063,000	958,000	1,056,000	220,000	333,000	326,000
Ore., Wash. & Mont.	310,000	321,000	386,000	379,000	298 000	462,000	520,000
	12,967,000	15,128,000	14,971,000	16,855,000	6,080,000	10,593,000	12,319,000

*Revised. †Began producing June, 1924.

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1923 AND 1924, IN BARRELS

Month	Production 1923	Production 1924	Shipments 1923	Shipments 1924	Stocks at end of month 1923	Stocks at end of month 1924
January	7,990,000	8,788,000	5,628,000	5,210,000	11,477,000	14,155,000
February	8,210,000	8,588,000	6,090,000	5.933,000	13,596,000	16,815,000
March	9,880,000	10,370,000	10,326,000	8,995,000	13,045,000	18,189,000
First Quarter	26,080,000	27,746,000	22,044,000	20,138,000	.....	.....
April	11,359,000	11,726,000	12,954,000	12.771,000	11,463,000	17,159,000
May	12,910,000	13,777,000	14,257,000	14,551,000	10,144,000	16,403,000
June	12,382,000	13,538,000	13,307,000	15,036,000	9,168,000	14.903,000
Second Quarter	36,651,000	39,041,000	40,518,000	42,358,000	.....	.....
July	12,620 000	14,029,000	13,712,000	16,614,000	8,081,000	*12.319,000
August	12,967,000	15,128,000	14,971,000	16,855,000	6,080,000	10,593,000
September	13,109,000	.....	13,698,000	.....	5,533,000	.....
Third Quarter	38,696,000	.....	42,381,000	.....	.....	.....
October	13,350,000	.....	14,285,000	.....	4,612,000	.....
November	12,603,000	.....	10,251,000	.....	6,991,000	.....
December	9,997,000	.....	6,408,000	.....	10,900,370	.....
Fourth Quarter	35,950.000	.....	30 944,000	.....	.....	.....
Preliminary Total	137,377,000	.....	135,887,000	.....	.....	.....
Amt. of under est.	83,238	.....	25,118	.....	.....	.....
Final Total	137,460,238	.....	135,912,118	.....	.....	.....

*Revised.

IMPORTS AND EXPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1923 AND 1924, IN BARRELS*

Month	Imports 1923	Imports 1924	Exports 1923	Exports 1924
January	71,686	153,732	74,169	88,586
February	20.529	162,930	88,531	62.606
March	66,521	160,517	98,861	91,224
April	76,899	148,138	85,662	83,200
May	88,480	161,304	103,634	88,850
June	111,559	196 655	77,203	74,064
July	286,106	109,098	82,774	60.139
August	324,008	(‡)	73,201	(‡)
September	215,785	.....	77,121	.....
October	172,051	.....	74,302	.....
November	140,590	.....	85,743	.....
December	104,422	.....	80,487	.....
	1,678,636	.....	1,001,688	.....

*Compiled from records of the Bureau of Foreign and Domestic Commerce.

‡Imports and exports in August, 1924, not available

The imports in July were from Belgium, 49,953 bbl.; Norway, 44,764 bbl.; England, 8656 bbl.; Denmark, 3908 bbl.; Germany, 1722 bbl.; other countries, 95 bbl. The imports were received in the following districts: Hawaii, 31,807 bbl.; Los Angeles, 28,572 bbl.; Massachusetts, 9603 bbl.; Oregon, 8001 bbl.; Florida, 6720 bbl.; San Francisco, 5588 bbl.; New Orleans, 5219 bbl.; Washington, 4909 bbl.; Porto Rico, 3908 bbl.; New York, 3610 bbl.; other districts, 1161 bbl.

The exports of hydraulic cement in July, 1924, were 60,139 bbl., valued at $186,073, of which was sent to Cuba, 24,711 bbl.; to the other West Indies, 2272 bbl.; South America, 17,592 bbl.; Mexico, 7540 bbl.; Central America, 4127 bbl.; Canada, 1171 bbl., and to other countries, 2726 bbl.

The statistics of imports and exports of hydraulic cement in August, 1924, were not available.

Ford Motor Co. Operates Own Sand Plant to Supply Its Plate Glass Works

As in All Ford Operations, the Safety of the Operatives and Cleanliness and Neatness Play a Principal Part

By George M. Earnshaw
Central Representative, Rock Products

WHEN I went through the Ford Motor Co.'s new cement plant at Detroit, a few weeks ago, I was astonished to find so many innovations having to do with safety for employes, and the cleanliness of the place. So much so, that I featured these in a description published in Rock Products of August 9. But Mr. Ford's cement plant "has nothing on" his glass sand plant at Cabot, Penn., and for that reason, if no other, it is worthy of a place in Rock Products' columns.

The glass sand plant is located about 17 miles north of Glassmere, Penn., on the Pennsylvania railway. The operation was formerly owned by the Little Buffalo Creek Sand Co., who sold a half interest in it to the Ford company when the latter acquired the Allegheny Plate Glass Co. plant at Glassmere, in February, 1923. On September 1, Ford acquired the other half interest and it was then that the transformation of the plant was begun. One of the first things done was to ship a few dozen barrels of paint to the works, for Mr. Ford certainly believes in having his holdings look "spick and span." The illustrations show that the paint was used to good advantage.

There is always handy a brush and a bucket of paint in case a smudge or stain occurs on the building, either inside or outside. Later there will be grass and flowers about the plant, as nature takes its course.

This is how the plant looked after Ford's painters did their stuff. Even at this isolated place, they believe in advertising. Note the sign

The Quarries

The plant draws sandstone from two quarries, a track from each coming in at right angles to the plant from north and south. One quarry is comparatively new. This has a 35-ft. face, about 300 ft. long. The other, the old quarry, has a face of approximately 55 ft. in height, and is about 600 ft. long, following a semi-circle. The stone is typical of the Pennsylvania (Oriskany) sandstone, from which so much of the silica sand of the country comes.

In quarrying, well-drill holes are put down by a Keystone machine and pop-drilling is done by a battery of BCR-4 Ingersoll Jackhamers. Air is supplied by an Ingersoll-Rand, Model XRB compressor, driven by a 100-hp. motor. There is a second compressor, Class ER-1, driven by a 50-hp. motor, which is used as an auxiliary. The compressor motors and all the other motors in the plant are Westinghouse.

There are three steam shovels on the job. One is a Marion 31, mounted on traction wheels, and the other two are Type B, Eries, equipped with crawler tread and fitted with ¾-yd. buckets. One of the latter is in the new quarry. Stone is hauled in 3-yd., all-steel, Easton cars, four to the train, by Plymouth gasoline locomotives, of which there are two, and a Fordson tractor with locomotive attachment, furnished by the Ideal Equipment Co., St. Louis.

The Plant

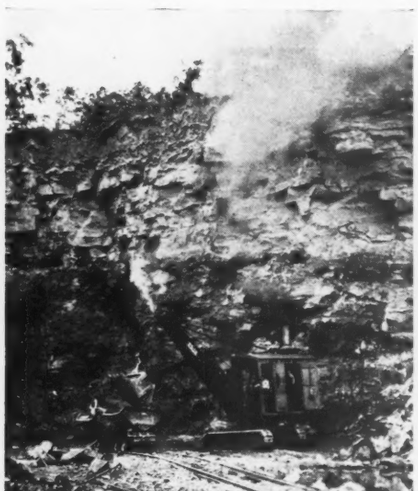
The primary crusher is a 36x42-in. Traylor jaw, powered by a 50-hp. motor. The cars are side dumped directly into it and because of its great size the crusher is practically self feeding.

A noticeable feature of the plant is the fact that it is roomy—plenty of space for everything. The dumping floor at the

big crusher is provided with railing and although this is one of the dirtiest places around the average plant, the floor in this plant is kept almost spotlessly clean. But even so, the superintendent complained that the place was in bad shape and that he wished he had known he was to have visitors.

From the jaw crusher the stone is chuted to a stationary bar grizzly and all that passes through it drops into a 20-in. belt-bucket elevator of 50 ft. centers which

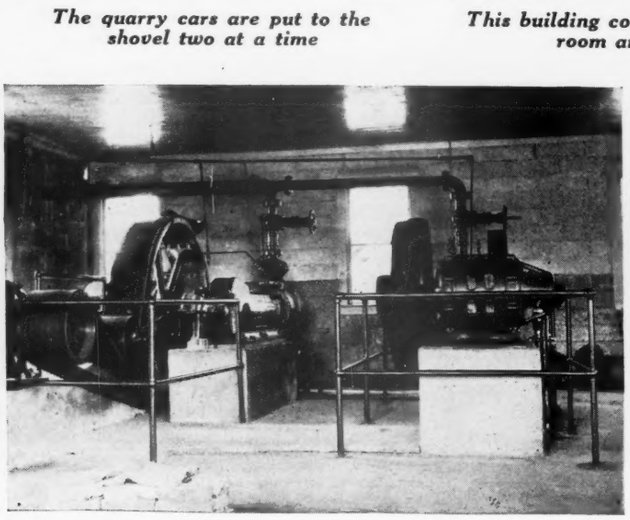
At the left is a scene in the new quarry. Observe the locomotive driver wiping off his engine. Right—Close-up of gasoline locomotive. The engineer's smile is evidence of his pride in how clean he keeps "her"

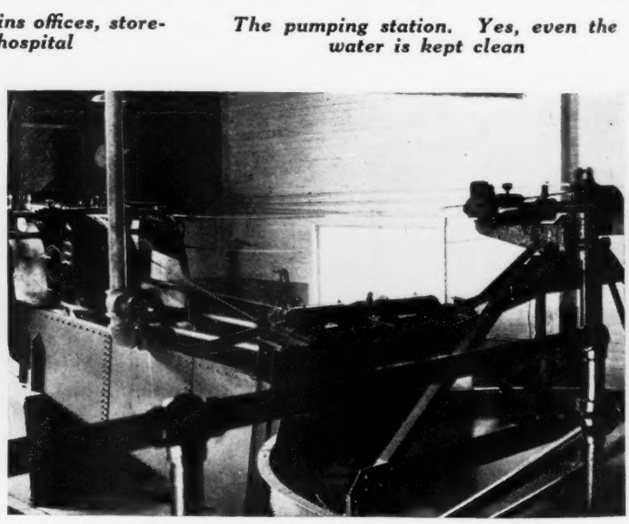


The quarry cars are put to the shovel two at a time

This building contains offices, storeroom and hospital

The pumping station. Yes, even the water is kept clean

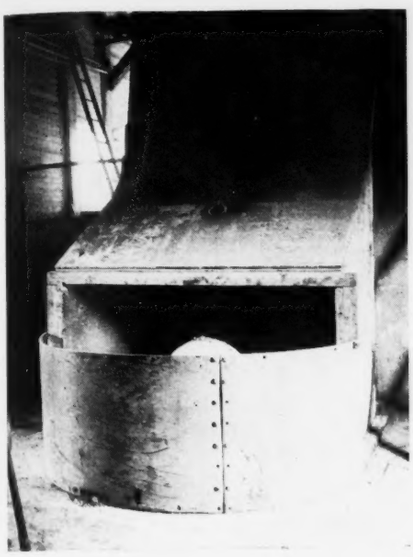




Left—Compressor room. The machines are enameled and are kept "in the pink of condition." Right—One of the classifiers and rakes. Note safety provisions

discharges into a 200-ton storage bin. Stone retained on the grizzly (which has 2-in. openings) is fed into a No. 10 Traylor gyratory, the product of which goes to the same elevator. The gyratory and the elevator are driven by a 50-hp. motor.

The stone is removed from the bin through two openings, each attended by a man. An automatic feeding device was tried out but proved to be impractical because a uniform flow was not desired, owing to a fluctuation in the production of the grinding equipment. Each opening serves a 9-ft. Stevenson wet pan fitted with 7/16-in. screens. From each wet pan the product which is now sand, is fed into a



This is how cleanliness is provided at the secondary crusher. A simple arrangement, isn't it?

horizontal revolving screen, 30 in. high by 8 ft. in diameter. These screens were designed and made at the plant by the company's own engineer and are serving satisfactorily as a final screening unit. The rejections from the screens move back into the wet pans by gravity. The screens are fitted with No. 305 Tyler "Ton-Cap," the openings of which are about 1/16x3/8 in. Both of the wet pans and the screens are powered by one 100-hp. motor

This view was taken from the north side and gives a better idea of the plant's flow sheet

From the screens the sand is sluiced to two 12-ft. Dorr classifiers, which remove the dirt and other foreign materials. Each classifier is equipped with a 24-ft. rake. These discharge the sand into an 8-in. pipe line through which it flows by gravity directly into railway cars. If there are no cars available, the rakes discharge on 14-in. belt conveyors of 60-ft. centers, leading to storage bins. Both classifiers and rakes are powered by one 7½-hp. motor.

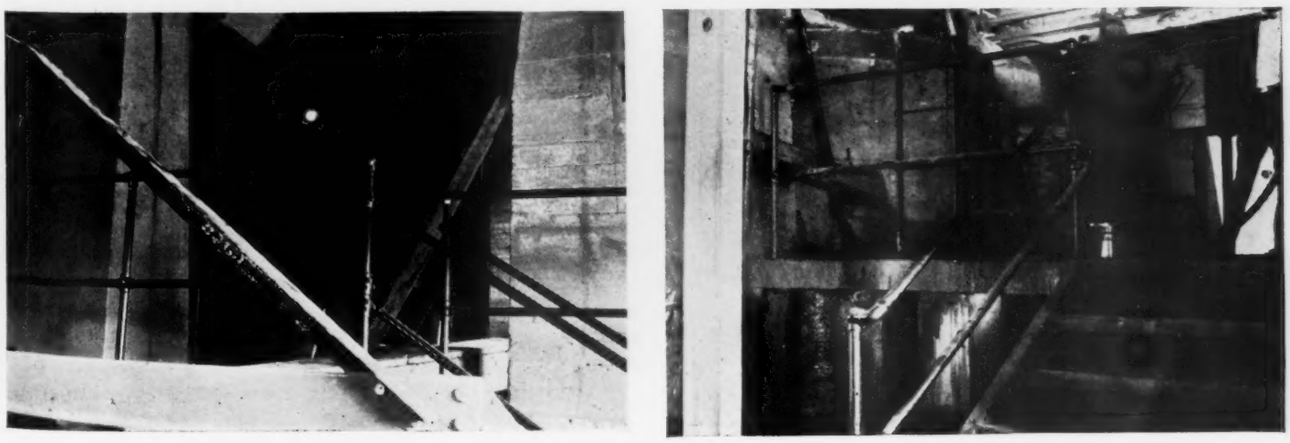
Water for the entire operation is furnished by one pump—a 9½x8 Worthington triplex, powered by a 20-hp. motor. It pumps directly into a 20,000-gal. tank through a 6-in. line. From the tank the water is distributed to the various points of use, through 4-in., 3-in. and 2-in. lines.

In every way possible throughout the plant, safety features are provided of the most efficient and positive type, so that it is practically impossible for an employe to meet with accident. Next in importance comes cleanliness, in which paint plays the leading role. *Everything* is painted, and in colors that are harmonious and pleasing to the eye. Cleanliness about a plant goes a long way toward developing efficiency, and efficiency means production. That is why it is Ford's policy to let safety and cleanliness have priority over production, for with them it is shown production practically takes care of itself.

The plant produces eight cars of sand per day employing in all, about 42 men. The entire output is consumed by the company's glass plant at Glassmere, so that the plant, like all other of the industries Ford engages in, is simply a part of his plan to meet his basic requirements from his own resources.

International Trade in Cement

TRADE information Bulletins Nos. 205, 213, and 220, issued by the United States Department of Commerce deal with the international trade in portland cement, the first named in North and South America, the second in Europe and the third in Asia, Australia and Africa. Production methods are not included, the text being confined to statistics of production, sales and prices with some discussion of the figures. All these are compilations from official reports.



These two illustrations are interior views which show in part the provisions made for safety and cleanliness. In the center of the view at the left may be seen a pulley guard which also serves as a catch pan for oil drippings

Hints and Helps for Superintendents

Hand Winch Converted to a Small Power Hoist

A HAND winch or "crab" will lift a considerable weight but it acts very slowly when run by hand on account of the gear ratio. The picture shows how such a winch was converted into an efficient small hoist.

The handles were taken off the pinion shaft and a good sized pulley put on, giving as much reduction as possible to the motor speed. This pulley was belted to a small motor and the job was ready. The winch was already provided with a brake and a longer lever made it easy to operate from a standing position. The motor is started and stopped by a switch.

The use of such a machine is for a temporary job, or where there is no time to wait for delivery of a larger hoist. Such a device can hardly be expected to stand the strain of continuous operation for more than a short time.

Closing the Door of a Quarry Car

A CLEVER device for closing the end door of a quarry car, which is used at the Steelton quarry of the Bethlehem Mines Corp., is shown in the accompanying picture. It stands at the foot of the incline, up which the quarry cars are drawn to the crushing plant. These cars have an end door with a latch that must be fastened to hold the door closed before the car is filled.

After the cars are dumped they are dropped down the incline with the end door swinging loosely. At the foot of the incline the latch strikes the bent bar which is shown in the picture and this lifts the latch. There is enough resistance from friction to close the door at the same time the latch is lifted. When the center of the hump has been passed the latch begins to fall and drops into the notch that holds the door closed.

This simple arrangement works every time and saves the work of one man. A gasoline locomotive picks up the empty cars after the doors have been closed and runs them out to the steam shovel.

Caterpillar Type Shovel Used to Ditch Railroad Cut

By J. O. ELY

Resident Engineer, Cherokee Rock Asphalt Co., Cherokee, Ala.

THE Cherokee Rock Asphalt Co. of Cherokee, Ala., recently completed the laying of a spur track to their asphalt deposits 2½ miles southeast of Cherokee. In construction of this spur it was necessary to excavate through a hill 900 ft. long, the maximum cut being 11 ft. The work was done during very unfavorable weather, and this fact, combined with the class of material encountered, caused the ditches to fill up a short while after the track was laid. In fact, on account of the mud, cross-laying with poles and cross ties was resorted to in several places to support the track. As it was desired that track laying be completed quickly it was not consistent to wait for

This caterpillar type shovel dug a ditch beside a railroad track by using a mat on the rails

Hand winch converted into a small power hoist by replacing the handles with a large pulley and belting to a motor

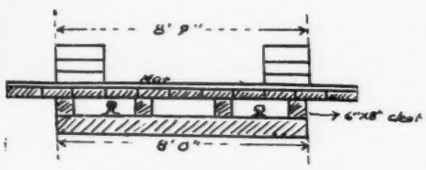
The hump in the bar lifts the latch and the friction holds the door closed until the latch drops into the notch

proper weather in which to lay through this cut.

Soon after track laying was completed it was seen that the foregoing cut would have to be ditched immediately if it were to be operated economically. Ditching by hand

Working in a wide part of the cut with the shovel blocked up

and hauling the material out on push cars was too expensive. The railroad company from whose track the asphalt spur diverged were not in position to lend one of their steam ditchers. The asphalt company has two caterpillar type shovels equipped with ¾-yd. dippers. The resident engineer conceived the idea of ditching this cut with one of these shovels by operating the machine on mats over the tops of the rails. For use in soft material, three mats 11 ft. long by 4 ft. wide constructed of 4x8-in. oak lapped with 2x8-in. oak, had already been constructed. To these mats 6x8-in. cleats were spiked, one 4 ft. each side of center of mat and one 18 in. each side. These mats were laid on top of the cross ties which, being 8 ft. long, in this case made the ends of the ties flush with the outside edges of the cleats. From outside to outside of the caterpillars is 8 ft. 9 in. Hence, all but 4½ in. of each caterpillar had bearing through the cleats on the ties. Each mat was provided with a ring in center which made it very



Section through the mat

easy to shift it ahead with the dipper. The sketch herewith shows a cross section of the track and longitudinal section of the mat.

The photographs show the machine in the cut. When views were made, the machine was working in a part of the cut which had to be widened and was machine blocked up on one side.

By the foregoing method, the cut was ditched successfully in four days. As no dump cars were available, the material was wasted on top of the cut.

It was thought that this information might be of assistance to industries which operate caterpillar type shovels in their quarries or pits, who maintain their spur tracks and who naturally have cuts which require ditching. Of course, it is necessary to discontinue operation of the track for a few days.

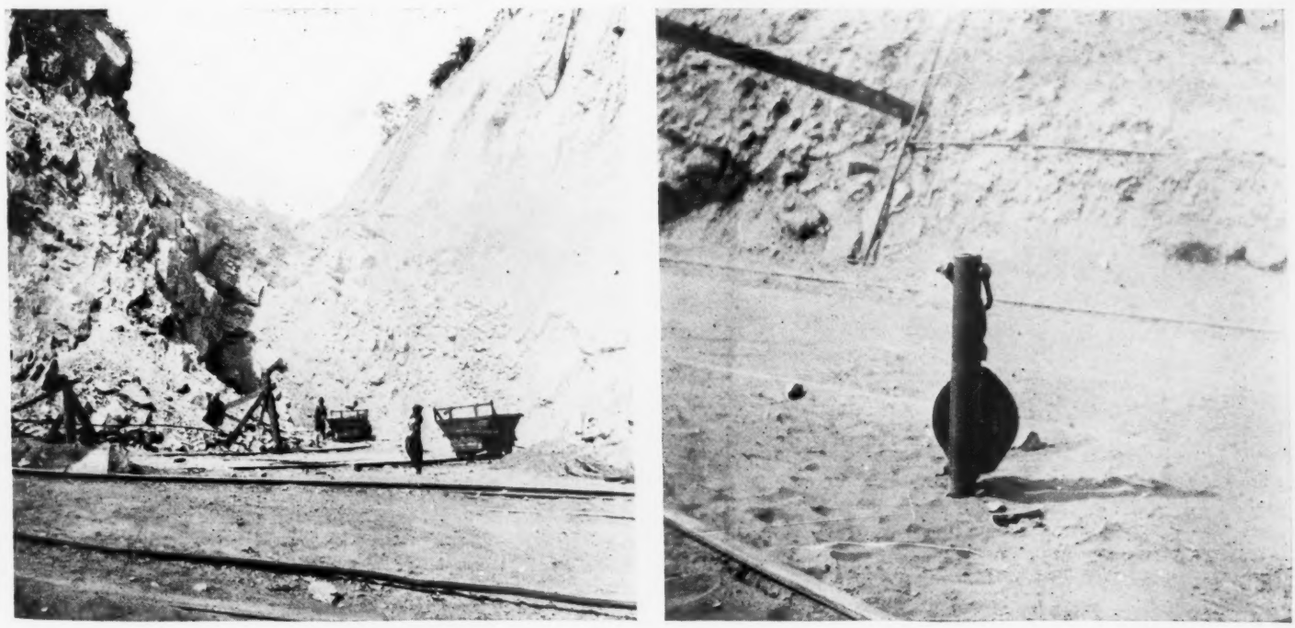
Pulling a Quarry Car Around a Corner

IN most quarries where cars are pulled up an incline to the crushing plant by means of a hoist they are usually brought to the foot of the incline by some other means than the hoist. Perhaps the commonest way is to push the cars to the foot of the incline by hand but mules and gasoline locomotives are often used.

The two illustrations show how the hoist may be made to do all the work. A snatch block is hung on a post (made in this case of 4-in. pipe) and this holds the rope until the car is near enough to the foot of the incline so that the pull is fairly straight. Then the rope is slackened and falls out of the groove in the sheave and the car is pulled on up the incline.

In the Hazel Atlas Glass Co.'s quarry work is carried on at two faces which stand at right angles to the plant incline. There are two posts with blocks so that cars may be pulled from either the right hand or the left hand face. One man can attend to the rope and switch the cars first to one side and then to the other. Of course the rope is disconnected from the empty car and hooked on to a full car before hoisting.

One illustration shows the left hand quarry face. The car nearer the post is an empty that has just been let down the incline. The man by the full car will hook on the rope and then the rope tender, who is not in the picture, will slip the rope in the sheave so that the car may be pulled away from the face.

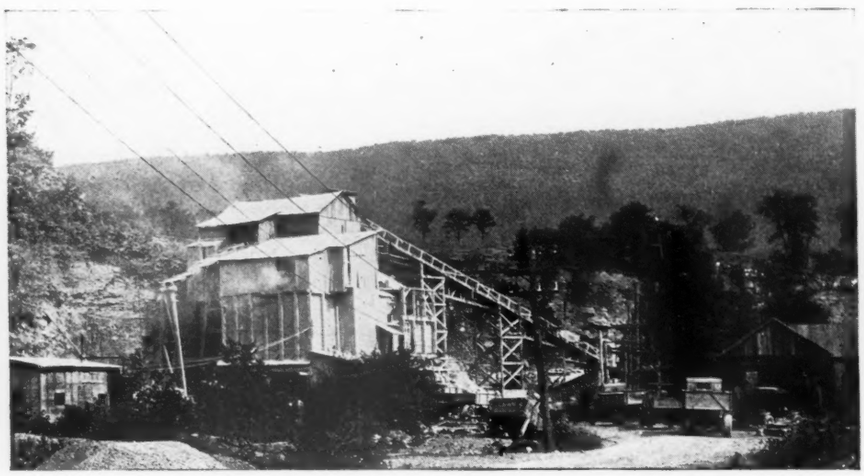


Left—The left-hand quarry face. The empty car has just been let down and is passing the post and snatch block. Right —The post and snatch block for turning the pull of the rope

National Limestone Company Makes Numerous Improvements

Adds New Electric Shovel, Large Primary Crusher and Other Equipment which Will Double Its Production

THE National Limestone Co., which has its plant and its quarry and general office at Shraders, about 10 miles out of Lewistown, Penn., is one of a number of plants in Central Pennsylvania that have found it necessary to enlarge their operations in order to keep up with the demand for crushed stone. All commercial sizes of crushed stone are made and the product is used for highway material and concrete aggregate. The company has a fleet of 20 motor trucks with which to make local and highway deliveries and it also ships by rail. The dust is sold in part as agstone and the remainder is fine concrete aggregate.



The crushing plant with part of the company's fleet of delivery trucks

The quarry face is 110 ft. high, and the holes are put down 10 ft. lower than the face, which is about 5 ft. deeper than the ordinary practice. As the ledges lie at a considerable angle with the horizontal the floor has to be "made" as the rock is loaded and the deep holes obviate the leaving of "toes" which would have to be broken down later.

The holes are put down by a Loomis Clipper drill and are spaced 15x20 ft. The dynamite used is of a lower grade than is commonly used in these parts, being only 20% and 30%. The 30% is placed in the bottom of the holes.

The quarry cars used hold 6 yd. each and were made by the Eastern Car Construction Co. They were being loaded by an Osgood No. 29 steam shovel when the quarry was visited by the Rock Products editor, but a Marion No. 39 electric shovel with crawler tread was being erected and both shovels will be in service by the time this appears in print.

The cars are pulled into the primary breaker by two Whitcome gasoline locomotives. One of these has been in service for some time, the other, a 7-ton machine, was just being started to work on the day the quarry was visited.

The primary breaker is another recent addition to the plant. It is a 30-in. McCully gyratory with a capacity of 300 tons per hour, on this rock. The mouth is set level with the quarry floor which breaks off sharply for some 15 ft. or so to the level of the railroad track of the plant. This has given an excellent opportunity to install the breaker in such a way that the cars do not have to be raised to dump into it, and yet neither the crusher nor the motor is below ground.

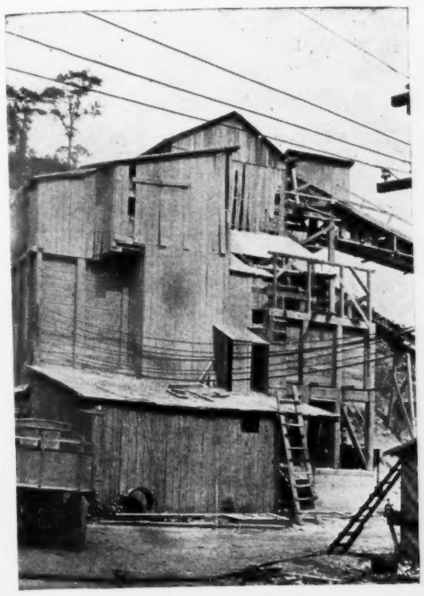
The cars are dumped by a hook attached to a Curtis air hoist. They are side dump cars and the hook has only to be caught under one edge and then lifted by the hoist.

Left—Quarry train and gasoline locomotive. Right—The newly installed primary crushing plant. Air hoist suspended from frame dumps cars and handles large pieces

The same hoist may be used for turning an extra large piece of rock.

The primary crusher discharge goes to a 36-in. belt conveyor with 200 ft. centers. This dumps the rock on a Robbins Cataract grizzly at the top of the plant.

This grizzly is rather new and is the first



End view of crushing plant

which the writer has seen installed in a rock crushing plant. It is made up of a series of revolving disks, the spaces between the disks and the shafts which carry the disks making the opening through which the undersize passes. The revolution of the

Sam Sheffer, assistant superintendent

disks helps to carry the undersize through and prevents clogging.

From the grizzly the undersize passes over a slotted scalping screen of the company's own design and make. The oversize of this screen and that of the grizzly go to a No. 7½ McCully gyratory. The discharge of the crusher and the undersize of the scalping screen are elevated together to the main (Worthington) plant screen, which is 60-in. diameter and 27 ft. long. The oversize of this screen goes to a No. 6. Reduction crusher and thence by a bucket and belt elevator to a 48-in. by 20 ft. Worthington screen. All products of the same size from both screens are sent to the same bins.

Conveyor from primary crusher to screening plant

New electric shovel being erected at the plant

Quarry face. Note inclination of the strata which causes floor to be made

The products usually sold are: Dust (agstone) up to ⅜-in.; ⅜-in. to ¾-in.; 1-in. to 1¼-in.; 1¼-in. to 1½-in., and 1½-in. to 2½-in.

Preparations are being made for installing

a washing plant for washing the fines. This will consist of one or two Lewiston sand-washers, the same machines that are so much used for washing silica sand.

The equipment of the quarry includes a Sullivan Angle compound air compressor and Sullivan jackhammer drills for block holing.

A. L. Sheffer is president and general manager of the National Limestone Co. and O. J. McNit is secretary and treasurer. Sam Sheffer, the president's son, is superintendent in charge of operation.

The postoffice address of the company is Naginey, Penn.

Le Roy, Minnesota, Hopes to See a Cement Plant Built

RECENTLY this village was favored with a visit from Mr. W. J. Budd of Vancouver, B. C., an experienced cement manufacturer of many years standing, who came to look over the prospects for locating a factory at this point.

He was taken over the fields of lime rock that are so plentiful in this locality by a number of the business men of Le-Roy and was so impressed with what he saw that he decided to remain over night.

A meeting of the commercial club was called which was largely attended by the members. Mr. Budd put up a very allurring proposition which seemed to appeal to those present. An expression of the sentiment of those present was taken and it seemed that all were strongly in favor of getting back of the proposition whereby the community can cash in on the vast wealth that has been put here by nature for our benefit.

If the plans as laid out are successfully brought to a culmination it will mean an industry capitalized at about $1,000,000 and provide employment for scores of people, besides adding many to the population of the village.—*LeRoy (Minn.) Independent.*

Suggestion for an End Point of the Screen Test

EVERYONE who has to make screen tests has his own way of judging when the test is finished, for a little undersize will continue to fall (from abrasion of the grains) so long as the screens are shaken. The following method proposed by John Gross in *Mining and Metallurgy* is well worth considering:

"A proposed unit of manipulation by hand screening based on that of the United States Bureau of Standards for cement sizing (Technological Paper No. 42, U. S. B. S.) and on that recommended by the United States Bureau of Mines in co-operation with Committee D-5 on Coal and Coke, American Society for Testing Materials, for pulverized coal, could be adopted for other sizing tests, thus confirming to a line of practice already established.

"Such a proposed unit of manipulation is a one-minute period of hand screening and may be designated as a one-minute cycle, carried out as follows: The weighed sample is placed on the sieve with pan attached. The cover is put on and, holding the sieve in one hand at a slight angle, 150 strokes per minute of about eight inches in length are given, striking the other hand gently upon the upward stroke. At the completion of each 25 strokes the sieve is turned 1/6 revolution so that a complete revolution of the sieve is obtained during the cycle. The angle at which the sieve is held and the sharpness of the stroke are such that the material is moved across the sieve at each stroke; the movement can be felt as well as heard.

While this one-minute cycle appears to be rather tedious it becomes an almost automatic operation after a very short time."

Candidate for Governor in Washington Gives His Ideas of Cement Manufacture

According to the *Spokane (Wash.) Spokesman-Review,* Edward Clifford a candidate for governor of the state of Washington is advocating thatt the state should build its own cement plant. If Mr. Clifford is correctly quoted, he must have drawn his information concerning the making of portland cement from sources that are not open to the rest of us, for he places the manufacturing cost at $1 per bbl., *including maintenance cost, material, labor, original investment, depreciation and taxes.* Many cement manufacturers in the United States would like to know how this can be done. His statement that Washington pays the highest price of any state in the union for cement is not borne out by ROCK PRODUCTS markets. The newspaper report quotes Mr. Clifford as saying:

"First of all, I am for the highway construction program and, secondly, I am for constructing highways with cement," he said. "My position is this: That the present specifications enforced on state highway contracts are such that only domestic cement can be used; that the price specified is $2.75 a barrel, less 40 cents for returned sacks, and that the people of Washington are consequently in the grip of the four local portland cement factories.

"There are two ways to avoid the excessive cement charges made by the portland monopoly—either by encouraging the development of new private cement industries in Washington or by allowing the state to manufacture its own cement. We have all the necessary materials for this industry in Washington and the average cost of manufacturing cement in this state does not exceed $1 a barrel, including maintenance cost, material, labor, original investment, depreciation and taxes.

"Why is it that Seattle pays the highest price for its cement on the North American continent, at the average rate of $2.90 a barrel, and that Washington pays the highest price of any state in the Union? Since the enactment of the administrative code, the cost of highways in Washington has materially increased."

Dolese and Shepherd Quarry Employes Observe Defense Day

EMPLOYES of the Dolese & Shepherd quarry at Hodgkins, Ill., observed defense day as requested by the War Department. Nearly 150 men assembled at the luncheon hour and a salute of 21 shots was fired while Old Glory was raised.

Supt. Thomas Jones, who was instrumental in arranging the program, then read the official bulletin from General Hale describing industry's part in national defense and the workers sang "America," led by David Nelson.

Dick Smith of La Grange talked to the men on what defense day meant to them personally, urging them to avail themselves of the right to become citizens (as a number are of foreign birth) and said that in the next war, industry and wealth would be conscripted as well as men. He stressed personal and general education as a means for preventing war and told the men that they each had a personal responsibility in national defense and government.

Mr. Otterson of Chicago, representing a steam shovel company, also spoke a few words on the day.

Charles Nelson and his corps of able assistants were ready with lunch for the entire gathering and the group, many of whom are Austrian and Italian, understood better the purpose and plans of the United States government after the meeting.

Col. O. P. Chamberlain, vice-president and general manager of Dolese & Shepherd, who is past commander of the La Grange Post No. 41, American Legion, was called to Washington, D. C., to assist in the defense day exercises and to participate in the reception in honor of Retiring General Pershing and the new Chief of Staff General Hines.—*La Grange (Ill.) Citizen.*

Wolverine Portland Cement Dividend

THE Wolverine Portland Cement Co. of Coldwater, Mich., declared a dividend of 5% on the common stock, payable October 1 to stock of record September 5. Last dividend paid was August 15, this year, a quarterly of 1½%.—*Wall Street News.*

Editorial Comment

State Owned Cement Plants

Michigan and South Dakota have state cement plants and a candidate for governor in Washington says that Washington needs one too. This candidate has posted himself on the subject of cement making, and, according to a newspaper report, given elsewhere in this issue, he knows what it costs to make cement. It costs one dollar a barrel. And to make sure that his hearers understood what the dollar had to cover the candidate explained that this cost included maintenance cost, material, labor, original investment, depreciation and taxes. One wonders why he left out obsolescence, which is just as good a word as some of the others he employed. ROCK PRODUCTS and other people interested in cement making would like to know the method he proposes to employ, as it is hard to see how a dollar could be stretched to cover the ordinary process of portland cement making including quarrying, grinding to impalpable fineness, burning in kilns that are heavy consumers of fuel, regrinding the hard clinker and finally barreling or sacking. It must also cover interest on an investment often running into millions and depreciation of machinery subject to extraordinary wear, not to speak of salaries, insurance, fire protection and a dozen and one other things that go to make up overhead. But it may be the candidate was misquoted. Wasn't it a dollar a ton he had in mind?

Sharp Practice in Selling

From a Southwestern city comes a report of a bit of sharp practice by which "way side pit" producers manage to secure a little business. A producer of this type whose output is only a few truck loads of sand a day has his drivers instructed to get their trucks in line when deliveries are heavy. The foreman, or whoever has charge of receiving the sand, signs the ticket without examining it closely and the sand is unloaded on the pile. With a signed ticket in hand collection follows, even though there may be objection and delay on the part of the contractor. The amount of sand that is sold in this way is so small that regular producers do not feel like making a fuss about it, and so the practice is continued. But there is another side to it. The material sold in this way is neither sufficiently clean nor well enough graded to be used in structural concrete. If thoroughly mixed in the pile of good sand it possibly may not do so much harm, but there is always the danger that it may be used by itself in a part of the building where strength is needed and thus cause a failure. The producers of aggregate have been properly educating the public to consider quality first of all in buying aggregate. They should see to it that their own good material is not contaminated by even a small quantity of poor material which is "slipped over" to the buyer by any such sharp practice as that described.

Stealing Aggregate

The loss by theft of sand, gravel and crushed stone is usually a small matter, although there have been such losses from the earliest days of the business. With the coming of the fashion of what may be called "home concreting" we may expect such losses to increase. One New England producer of crushed stone reports that he has found it necessary to put heavy doors on his bins and to lock them at night, as the losses from theft had grown to be serious. Of course a watchman is a preventive of theft, but it is a fairly easy matter to have a watchman called to another part of the plant for the time that is needed to shovel on a load of sand or stone. In the larger cities night deliveries of aggregate are increasing and the yards in these cities have night crews, which is a preventive of theft unless the crews are dishonest.

Cleanliness in Plants

In the article on the Ford glass sand plant in this issue it is said that the principle upon which Mr. Ford's plants are run is that if the plant is made safe for the workmen and kept clean and neat, production will take care of itself. With some reservations this is true. Cleanliness, to be sure, like any other virtue, may be carried so far as to be a vice, but few plant managers offend in that way. Too many plant managers (especially the managers of small plants who must watch the pennies carefully to keep the cost down) are prone to clean up by "fits and starts." That method is likely to be reflected in the production which will move in the same way. What is often needed is a better system, or organization, whereby the little things that need doing are done as the need arises and not put aside for a more convenient season. This costs no more in the end. Indeed it costs less. But it takes time and exceeding effort to establish such a system where it does not exist, for there is no more heartbreaking job than to train a slack crew to notice the little things that need attention and to give the attention at once. Yet many a manager's reputation has been made by taking hold of a run-down plant and training his men to put it in order and keep it that way. Keeping the plant and machinery clean and keeping them in good running order are so intimately connected as not to be separated. Keeping things safe for the men means that the men will go into places that they might otherwise neglect. This is the truth behind Mr. Ford's doctrine.

New England Portland Cement and Lime Co. Announces Directorate

W. R. Phillips Chosen as Vice-President and General Manager

THE New England Portland Cement and Lime Co., 1001 Beacon Trust Bldg., Boston, with plant at Rockland, Me., has officially announced its board of directors as follows:

Alfred S. Black, Boston, Mass., president.
Walter E. Bowe, Boston, Mass., treasurer. Formerly vice-president and cashier, Boston National Bank.
John J. Cunningham, Portland, Maine. President, F. W. Cunningham & Son, contractors; director, United States Trust Co., Portland, Me.; director, York County Trust Co.; first vice-president, Morris Plan Bank.
Charles A. Dodge, Cambridge, Mass. President, C. A. Dodge Co., contractors.
Charles A. Maguire, Providence, R. I. President and treasurer, Charles B. Maguire Co., contractors; president, R. I. Chapter Associated General Contractors of America; director, Builders and Traders exchange.
George G. Shedd, M. Am. Soc. C. E., Manchester, N. H. President, L. H. Shattuck, Inc., engineers, contractors.
James J. Scully, Cambridge, Mass. President, The Scully Co., contractors; vice-president, Building Trades Employers' Association of Greater Boston.
George W. Allison, Boston, Mass. Construction manager, Simpson Bros. Corp., concrete engineers, contractors.
Walter S. Rowe, Portland, Maine. President, Charles S. Chase Co., lime and cement.
Willard D. Woodbury, Boston, Mass. President and treasurer, I. F. Woodbury & Sons Co., contractors.
Guy A. Hersey, Bangor, Me. President and treasurer, Acme Manufacturing Co., lime, cement and building material.
Fred V. Murtfeldt, Boston, Mass. W. A. Murtfeldt Co., contractors; president, Master Sheet Metal and Roofers' Association.
Richard P. Keefe, Worcester, Mass. Keefe Bros., contractors; treasurer, Associated Contractors of Massachusetts.
James H. McNamara, Eagle Rock, Va. President, Eagle Rock Lime Co.
William P. Shine, Cambridge, Mass. Treasurer, Boston Structural Steel Co., Cambridge, Mass.; president, Cambridge Chamber of Commerce.
Richard W. Saunders, New York City. Comptroller, Famous Players-Lasky Corp.; formerly cashier, National Bank of Commerce, New York.
Fred C. Black, Thomaston, Me. President, Black & Gay, Canners. Inc.
Obadiah Gardner, Rockland, Me. Ex-U. S. senator; former member International Boundary commission.
S. T. Kimball, Rockland, Me. Attorney-at-law.

W. R. Phillips has resigned the position of vice-president and general manager of the American Lime and Stone Co., Bellefonte, Penn., to become vice-president and general manager of this new company.

Mr. Phillips is well known in the rock products industry due to his connection with the National Lime Association, which he served as general manager and secretary in 1922.

He was graduated in civil and mechanical engineering from State College, Penn., in 1906. After a year in government work, constructing dams, he went into sales engineering work and until 1913 he worked with the General Fireproofing Co., the Columbia Concrete Steel Co. and the Fletcher Bros. Co. in Pennsylvania territory. Then he went to the Austin Co. and until 1916 he had charge of the eastern division of their construction work. In 1917 he established his own construction company with headquarters at Bridgeport. During the war he served as civilian expert on industrial production in the Ordinance Department, having charge of the production of certain types of munitions.

Mr. Phillips is the type of engineer whose interest runs more to the executive and managerial side of production, and his experience has been along those lines. He is an example of the type of men who are

W. R. Phillips

placing the rock products industries on the highest plane not alone by their technical knowledge but also through their ability to organize and direct production.

Announcement of the formation of the New England Portland Cement and Lime Co. was made last spring. In ROCK PRODUCTS of May 3 was noted the purchase by this company of the properties of the New England Portland Cement Co., the Traction Securities Co. and their subsidiary corporations. These properties consisted of valuable limestone and clay deposits and shore property and dwellings in Rockland, Me. These had been controlled by Eugene Meyer, Jr., the late John A. Black of New York and Alfred S. Black of Rockland, Me., who is now president of the New England Portland Cement and Lime Co.

Mr. Black stated at that time that it was the intention of the company to make the industry one of the largest in the country. The company proposed to erect a modern lime plant with a capacity of 500,000 bbl. annually and a cement plant with a capacity of at least 2000 bbl. per day.

International Portland Cement Corporation to Begin Work in Virginia

TAZEWELL PETIT, of Suffolk, has been retained by the International Portland Cement Corporation of New York for the construction of the railroad, mining, and the operation of the washing plant which will be located near Chuckatuck, in Nansemond County, Va.

This work will begin at once. A standard-gage railroad from the mines to the Nansemond river will be one of the first of works constructed under the supervision of Mr. Petit.

The extensive marl beds in Nansemond County, lying near Chuckatuck, have been purchased by the International Portland Cement Company for a large sum. This is one of the most important developments in Nansemond County in recent years.

Besides the railroad, a wharf, washing plant and loading platforms will be erected on Nansemond river. The marl will be carried to South Norfolk to the new plant now in course of construction and will be used in the manufacture of Portland cement.—*Richmond (Va.) Dispatch.*

Plans of the White Portland Cement Company of Los Angeles

THE *Los Angeles Examiner* has the following account of the plans of the White Portland Cement Co. of Los Angeles, notes of which have appeared in earlier issues of ROCK PRODUCTS:

President Bentley stated that engineers have been commissioned and are now preparing plans for the first unit of the plant, which is to represent an investment of more than $750,000. This first unit will have a capacity for manufacturing 1000 bbl. of cement a day.

Upon the completion of the first unit, others will be constructed until the total $3,000,000 capitalization has been invested here and on the 1800-acre tract at Saugus.

A special feature of the new plant is the fact that it will have its own power system.

Mr. Bentley stated that the concern will also manufacture a gray cement in addition to the white.

According to present plans of the company, the first unit of the new Los Angeles cement works will be completed and ready for operation shortly after the first of the year.

The present officials of the White Portland Cement Co. include L. V. Bentley, president; Cecil J. Rhodes, C. H. Shattuck, W. B. Wilkerson, I. C. Ellis, T. H. Cannan and Lewis Cruickshank.

Bentley stated, however, that existing board of directors will be changed to include several prominent San Francisco capitalists.

First Shipments from Crystal Lake Sand and Gravel Plant

THE first shipment of sand and gravel from the new Wisconsin Lime & Cement Co.'s plant south of Crystal Lake (Ill.) was made Thursday, August 28, when 20 carloads of gravel were shipped to Chicago.

A second shipment of 20 cars was sent out Monday and in the near future regular daily shipment will be made.

The Wisconsin Lime & Cement Co. has just completed the erection of this plant which is said to be one of the largest and best equipped sand and gravel plants in this part of the United States. The company owns one of the finest gravel deposits hereabouts and when in full operation will make large shipments over the main line of the Northwestern to Chicago and other points.—*Crystal Lake (Ill.) Herald.*

The Hallock Sand Company, of Columbus, Ohio, Purchases Another Company

S. NEAL HALLOCK, president of the Hallock Sand Co., Hartman Building, Columbus, Ohio, has announced the purchase of the Chillicothe Sand and Gravel Co. The business at that plant is expanding rapidly, including many large road contracts in sight for completion before winter. The Hallock Sand Co. was formed several months ago, taking over the Mound Street Sand and Gravel Co. Mr. Hallock said that business was increasing steadily, his present contracts covering many of the larger buildings now being erected in Columbus. He has been in the sand and gravel business for many years.—*Columbus (Ohio) State Journal.*

Object to Paying for Washed Sand and Gravel in Sidewalks

CONSTRUCTION of cement sidewalks is costing Warsawans three to four cents a square foot more than heretofore as a result of the adoption of specifications for the construction of walks by the city council, according to information reaching the council at the regular meeting Monday evening. The increased cost is unwarranted, according to the councilmen. It is based by the contractors on the claim that they are required to pay more for washed gravel and sand which are required in the building of sidewalks under the ordinance passed several weeks ago by the council.—*Warsaw (Ind.) Times.*

[The experience of Danville, Ill., and some other cities is that the extra cost of washed sand and gravel in concrete sidewalks is many times repaid by the longer life and better wearing quality of the walks. —Ed.]

Convention of National Sand and Gravel Association to Be Held in Chicago

THERE was a meeting of the board of directors of the National Sand and Gravel Association at Hotel La Salle, Chicago, on September 16. It was decided at that time to hold the annual convention in Chicago on January 5, 6 and 7, 1925. These are the first three days of the annual Good Roads Show, which many members of the association wish to attend.

Meetings will be held in the forenoons of each day, leaving the afternoons free for visiting the road show or other attractions of the city.

The decision was reached after an all day discussion in which the advantages of a number of cities were talked over. A representative from commercial bodies of Grand Rapids, Mich., was present and pressed the claims of his city and many telegrams from business men in Kansas City inviting the association to hold the convention there were received.

It was decided to hold a meeting of the executive committee at Terre Haute, Ind., in October, probably on the 21st.

Those present were John Prince, president; J. R. Shiely, treasurer; directors, Dann, Haddow, Fletcher, Springer and Sutton, and T. R. Barrows, executive secretary.

Michigan Mineral Production

PRODUCTION and Value of Mineral Products in Michigan is a well bound book of 146 pp., issued by the geological survey division of the Michigan department of conservation. It is mainly statistical and there are excellent tables showing the production and value of various substances from 1905 to 1922. The non-metallic mineral products, limestone and lime, glass sand and gravel, cement, etc., are all included.

Always Something

AN ardent motorist met at the pearly gates by Saint Peter, glanced admiringly down the main street of heaven.

"Fine!" he cried. "What a splendid highway! Where are all the cars?"

"There aren't any," replied Saint Peter. "You'll find all those below."

"Then I'll go there," pouted the motorist. Soon he faced Satan and was delighted at the sight of many beautiful automobiles parked just within the gates. He entered eagerly.

"Which car is mine?" he asked.

Told to take his choice, he hurriedly climbed into one finer than the rest.

"Great!" he ejaculated. "Now which way do I go? Where is the road?"

"There isn't any," said Satan. "That's the hell of it."—*Western Canadian Motorist.*

Gravel Company Wants City Enjoined from Interfering with Its Plant

HEARING on the suit of the Lancaster (Ohio) Gravel and Sand Co. against the City of Lancaster was held recently in common pleas court.

The company is endeavoring to make permanent the injunction allowed it prohibiting the city from interfering with the operation of its plant east of Madison avenue.

Court action resulted from the passage of an ordinance by City Council, prohibiting the digging of gravel pits within the city limits. This ordinance followed petition of residents living in the vicinity of Madison avenue.—*Lancaster (Ohio) Gazette.*

Greenville Gravel Company Donates Gravel for Public Swimming Pool

AT a meeting of the Paulding Community Club a committee was appointed to go to Greenville, Ohio, to consult the management of the Greenville Gravel Co., to solicit a donation of gravel from the company for use in the bottom of the new community swimming pool.

The pool will be about 100x450 feet in dimensions, and County Surveyor Green had previously estimated that it would take about 12 cars of gravel to cover the bottom of the pond to a depth of four inches.

The committee went to Greenville Tuesday afternoon, and upon suggestion to the manager of the company that a donation of enough gravel for a four inch covering would be appreciated by the people of Paulding, were much elated when that gentleman suggested that 12 inches would be better, and that the company would be pleased to furnish free of charge as much gravel as the promoters of the project might want, up to 40 cars, same to be shipped as rapidly as wanted.—*Paulding (Ohio) Democrat.*

Geology and Mineral Resources of the Kings Quadrangle

THIS is the sort of geological report of which we should have more. It was written by J. Harlen Bretz, who, although a geologist, has not supposed his readers knew as much geology as he knows, and so he has taken pains to explain different points as he goes along. It is a report that will interest rock products men since it is practically confined to the limestone and sand and gravel deposits of the locality described (near Rockford, Ill.). Those who have no especial interest in the locality will find it good reading from the amount of general information it contains. It is published as Extract C from Bulletin No. 43 of the State Geological Survey, Urbana, Ill.

Zenith Limestone Company's Plant at Tulsa Ready to Begin Production

THE Zenith Limestone Co., Tulsa's newest industrial enterprise, will begin operation some time in September. With a capital stock of $250,000, the company will be headed by Harry Bell as president and R. D. Long, vice-president and general manager, both of Muskogee, Okla.

Construction of the company's crushing plant began in September, 1923. Now ready for operation, it will begin crushing stone with a capacity of 2000 tons daily. Located up the Arkansas river from West Tulsa, on the Enid branch of the Frisco, the plant covers 283 acres of ground.

The total investment of $250,000 is wholly that of Bell and Long, the company being a closed corporation. Bell is one of the wealthy land owners in this part of the state. Long, designer of the new plant, was also in charge of its construction and will personally supervise its operation.

The primary crusher weighing 370,000 lb., a standard locomotive, 10 standard flat cars, a Marion steam shovel and much other heavy machinery is included in the equipment of the new plant.—*Tulsa (Okla.) Tribune.*

Prices on Iowa Agstone

GROUND limestone for sweetening sour land or for one ingredient in a swine mineral mixture can be had now at a cheaper price than previously.

Dolese Brothers Co., 337 West Madison street, Chicago, has priced such stone per ton delivered at stations as follows: Victor, 88c; Ladora, 85c; Marengo, 82c; North English, 96c; and Williamsburg, $1.03, shipment to be made within ten days from receipt of order. (All these towns are in Iowa.) The stone comes from the company's quarry at Buffalo, Iowa, and is as good as can be had in the state, says County Agent Jentmire.

Because of the possibility of its becoming wet and freezing into a mass too big to handle, limestone cannot be moved with certainty, either at quarry or on the farm, after freezing weather sets in. And it cannot be had in large quantities on short notice so the safe thing is to order it now while it can be handled, thinks Jentmire.—*Cedar Rapids (Iowa) Republican.*

Rates on Crushed Marble

ON a proposed finding that charges collected on two carloads of crushed marble from Los Angeles, Calif., to Fort Bliss, Texas, shipped May 14 and August 3, 1921, were unreasonable, Examiner Lawrence Satterfield has recommended an award of reparation in No. 15459, Joseph Musto Sons-Kennan Co. vs. Southern Pacific et al. The case was presented under the shortened procedure. The examiner said that, in the absence of a commodity rate or specific classification rating on crushed marble, charges were collected at the applicable class E rate of $1.055 on stone, n.o.i.b.n., crushed or ground, minimum 40,000 lb., from California points taking rate basis 1 to group J points. The value of the commodity shipped was from $8 to $12 a ton, the examiner said and there was contemporaneously in effect between the two points in issue a rate of 65 cents, minimum 60,000 lb., on "stone, viz., marble, onyx, stone, rough," commodities said to be worth from $100 to $200 a ton at the time the shipments moved. There was a similar rate and minimum on "rock (lime), ground or unground." Effective with the general reductions of July 1, 1922, these rates became 58.5 cents, and on September 1, 1922, the description covering the latter commodity was changed to read "stone, crushed or ground," without restriction as to kind, which would embrace the article here considered, the examiner said. He recommended a finding that the rate assailed was unreasonable to the extent that it exceeded 65 cents.—*Traffic World.*

Massachusetts Lime Company Adds New Kilns and Crusher

THE Pittsfield (Mass.) Lime & Stone Co. is to add four new kilns to its plant at Richmond Summit; also a stone crusher, a hydrating and storage building, and a scales building, and equipment for all, the total cost of which is estimated to be upwards of $200,000. The plant capacity will ultimately be increased to 1000 bbl. of lime a day. The company owns about 260 acres, all of which is believed to be underlaid with limestone.—*Boston Transcript.*

Limestone Users Given Unique Recognition

CLINTON county (Ill.) farmers who give all the cultivated upland on their farms a liberal application of limestone are given unique distinction by their county farm bureau. They are designated as "Modern Pioneers in Agriculture" and their names placed under this caption on a large chart which hangs in a conspicuous place in the farm bureau office.

Up to the present time 45 farmers have won the distinction. They have used close to 21,500 tons of limestone in the last seven years in building up their land for bigger yields and more profitable returns, according to J. C. Spitler, assistant state leader of farm advisers at the college of agriculture.

Practically all the limestone used in the county has been put on since April, 1918, when the present farm adviser, Charles Rehling, took up his duties. Up until that time only two farms in the county had been covered with limestone, but Farm Adviser Rehling and the county farm bureau cooperated with the agricultural college in boosting the use of limestone and since that time the number of farms limed has increased each year.—*Vandalia (Ill.) Leader.*

Tennessee Highway Program

TENNESSEE, one of the most recent southern states to embark upon a program of good roads construction has a total of 98.798 miles of improved highways completed or under construction according to J. C. Creveling, state highway commissioner. In the state system, when completed there will be 4,170 miles.

Since the first of the year 217.22 miles have been completed for a total cost of $3,439,234. Of the 957.98 already completed or under construction 98.98 miles are of portland cement concrete, 511.35 miles are of sheet asphalt, asphaltic concrete or asphaltic macadam, 23.90 miles are of surface treated macadam, 37.08 are of waterbound macadam, 130.42 are gravel and chert, and 140.70 miles are graded and drained.

Railroad Orders New Cars for Shipping Phosphate Rock

THE engineering department of the Atlantic Coast Line is completing plans for an order of 200 phosphate cars. The cars are to be of 50 tons capacity and of modern type. They will be added to the already large number of phosphate cars operated by the company.—*Gaffney (S. C.) Ledger.*

Utica (Ill.) Cement Plant Burns

THE plant of the Utica Hydraulic Cement Co. was recently damaged by fire with a loss, according to unconfirmed report, of $200,000. This plant produces natural cement using upright kilns 15x 30-ft. in section.

Burning of Columbia Quarries Co.'s Plant at Krause, Ill.

A BRIEF message from E. J. Kraus, of St. Louis, to this paper, confirms the news of the burning of the Columbia Quarries Co. plant at Krause, Ill., and adds that it is the intention to rebuild the plant. The following account of the fire is from the *Columbia (Ill.) Star*. The plant is situated almost directly south of St. Louis on the Illinois side of the river:

"The fire started in the transformer house, where a high tension wire charged with 13,000 volts comes in. The transformer contains about 150 gal. of oil. Lightning struck the high tension wire and set the oil on fire. Near the transformer house, which is of brick, is the building that houses the motors and the crushers. This structure is a three-story one of frame construction and the flames from the transformer house leaped over where a window was open. In a short time the building was a seething mass of flames.

"It was apparent almost at once that the building could not be saved and efforts were directed, successfully, to save the adjoining buildings.

"The fire burned itself out and in several hours the building was a twisted mass of machinery. Expensive machinery too, for in the building were 11 electric motors ranging in horsepower from 150 to 5. Then there were the crushers and other equipment that was a total loss.

"The loss is estimated at $150,000. It is fully covered by insurance and liability insurance.

"The orders now on hand will be taken care of at Quarry No. 2 and at the Valmeyer quarry so it will be business as usual until such time as the plant is rebuilt.

"The Columbia fire department was sent out and managed, after some delay, to keep the fire from spreading. The quarry has its own fire engine and this too was used."

Owner Agrees That City May Fill His Dangerous Quarry

THE injunction suit proceedings of Joseph Perns, owner of a quarry at Sixty-five and Vine streets, Philadelphia, prohibiting city authorities from filling in a water hole at the quarry where several drownings have occurred, was ended when Perns agreed that the dangerous pool should be eliminated.

Counsel for the city and Perna agreed that the quarry shall be filled in until a dangerous pool of water is eliminated, but the city will not dump more dirt than is necessary for that purpose so that Perna may later recover the base rock. It was agreed that the filling-in should interfere as little as possible with the quarrying of upper rocks by Perna and should be limited to the water hole. In other parts of the quarry Perna may get the base stone if he wishes.

The adjustment of the dispute came at the end of Perna's injunction suit to restrain the ctiy from filling in the quarry. Perna testified he has owned the quarry nearly 29 years and if it were filled in it would cost him more than $50,000 to have the dirt removed. The best stone in the quarry is at the bottom, he explained.

Morris Wolf, attorney for Perna, contended that the city's plans to fill in the quarry amounted to confiscation of his client's property. Assistant City Solicitor Ryan had Perna admit that he knew the drain pipe in the quarry was clogged and that no steps were taken to keep it clear until after a drowning last spring. Perna attributed the clogging of the pipe to the dumping of dirt into the hole by outsiders. Perna recently put up a fence around the quarry and agreed to have the water pumped out following strong protests from neighbors whose children were accustomed to play there. He said he had undertaken a number of large contracts for building and construction work in Reading, Johnstown and Atlantic City and proposes to resume full operations at the quarry, which has not been operating capacity the last five years.—*Philadelphia Public Ledger.*

New Trap Rock Quarry at Birdsboro, Penn.

THE John T. Dyer Company purchased practically the entire Monocacy hill in Birdsboro, Penn., and expects by spring to have a trap rock stone quarry in operation. The company plans to have the quarry on the northern side of the hill, toward Amityville. A siding will be run from the Reading railway and the company will tunnel under the Philadelphia pike for the railroad siding connecting the main line of the Reading Company with the siding.

The present plant at Trappe Rock will be dismantled and removed. The quarry here was developed by the late John T. Dyer and opened 31 years ago. It grew until four crushing plants were in operation. Besides the Monocacy plant the Dyer company also has a plant at Robeson. The Trappe Rock property has been leased to the Birdsboro Stone Company, which will take possession the beginning of next year. —*Reading (Penn.) Eagle.*

Quarry Fatalities

QUARRY accidents in the United States during the calendar year 1922 is the title of technical paper 353, issued by the Bureau of Mines, Washington, D. C. It is mainly a collection of statistics but these are well worth the study of any quarry manager. It is well worth noting that there was a decrease in the number of accidents per 1000, both fatal and non-fatal, in 1922, as compared with 1921, although the decrease was slight. Fatal accidents were 192 per 1000 as against 2.00 per 1000 in 1921, and non-fatal accidents 171.93 as against 174.54 in 1921.

New York State Stone Association Visits Le Roy Plants

THE plants of the General Crushed Stone Co. and the Le Roy Lime and Crushed Stone Corp. in Le Roy were inspected by about 30 members of the New York State Stone Association, August 28. Accompanied by Alderman Almon L. Scott, superintendent of the general plant, and J. Leonard Heimlich, manager of the Le Roy plant, the party then drove to Rochester where the men inspected the plant of the Delemite Products. Dinner was served to the entire party at Manitou Beach. All are members of companies which own and operate limestone plants in this state.—*Rochester (N. Y.) Herald.*

New California Company to Operate Old Quarry

D. M. ROOT under a lease from the Pacific-Southwest Trust and Savings Bank of Fresno, is taking over the lime quarry, at Lemon Cove, Calif., that was formerly owned by the Kaweah Lime Products Co. and which later came into possession of the bank. The quarry, which has been intermittently in operation for 50 years, will be known hereafter as the Kaweah Quarries, according to local papers.

A bulk purchase of lime for commercial fertilizer is now being negotiated by the farm bureaus of five counties with the Kaweah Quarries. The agricultural limestone that is manufactured is guaranteed to contain at least 85% calcium carbonate. The new lessees will employ 15 men at the plant which is capable of producing 60,000 tons of agricultural limestone annually.

Judge Modifies Injunction to Allow Quarry Shot to Be Fired

A TEMPORARY restraining order restricting the Sandusky Cement Co. from blasting on a 40-acre farm in Sylvania township, has been modified by Common Pleas Judge Martin to permit the discharge of 40 charges of explosives set before the court action was taken. Tony Sylvester brought the action on the grounds that he has a lease on the farm and his buildings have been damaged by the work of the company. All blasting was stopped by the first order of the court.—*Toledo (Ohio) News-Bee.*

Texas Quarry Sold

THE Landa Rock Products Co. announces that it has purchased the plant and quarry of the Comal Stone Co. of New Braunfels, Texas.

The Comal Stone Co. is one of the well known crushed stone producers of the Southwest. It added a washing plant to its equipment not very long ago.

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert,
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning September 15:

Illinois Freight Association Docket

2729. Stone, crushed, stone screenings, agricultural limestone (not ground or pulverized), in bulk. Carloads, minimum weight, 90% of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply, from Milltown and Marengo, Ind., to Eldorado, Ill. Present, class rates, proposed, $1.26 per net ton.

2732. Cement. Carloads, minimum weight 80,000 lb., from Buffington, Ind., to O'Fallon and Orchard Siding, Ill. Present, combination of locals; proposed, 15 cents per 100 lb.

2737. Sand, molding. Carloads, minimum weight marked capacity of car except when loaded in open cars and to full visible capacity actual weight will govern from Pekin, Ill., to Odell, Cayocya, Chenoa, Ballard, Lexington, Towanda, Griggs, Broadwell, Elkhart, Williamsville and Shelbytown, Ill. Present, $1.01 per net ton; proposed, 88 cents per net ton.

2737. Sand, moulding. Carloads, minimum weight marked top cars and loaded to full visible capacity, actual weight will govern from Wilmington, Ill., to Rockford, Ill. Present, $1.65 per net ton (combination of locals); proposed, $1.40 per net ton.

2742. Cement. Carloads, minimum weight, 76,000 lb., from Davenport, Iowa, to Rock Island and Moline, Ill. Present, 8 cents; proposed, 3 cents.

2740. Sand and gravel. Carloads, minimum weight marked capacity of car, from Chillicothe, Ill., to Galesburg, Ill. Present, 88 cents per net ton; proposed, 80 cents per net ton.

2745. Sand and gravel. Carloads, minimum weight 90% of marked capacity of car used, to Whithall, Ill. (per net ton): From Louisiana, Mo., present $1.26, proposed 88 cents; from Nego, Ill., present $1.01; proposed 88 cents.

1808. Cement, natural portland, in bulk or packages. Carloads, minimum weight 50,000 lb., from Gulf Junction and Cape Girardeau, Mo., to stations on the N. C. & St. L. R. R. in Tennessee. Present, 29 cents; proposed, 18½ cents.

Central Freight Association Docket

5155. Sand and gravel. Mechanicsburg Gravel Pit, Ohio, to Marengo, Ohio. Present, 14 cents; proposed, 90 cents per net ton.

9156. Stone, crushed, stone, screenings, also agricultural limestone (not crushed or pulverized), in bulk, Milltown and Marengo. Proposed, $1.25 per net ton.

9198. Crushed stone. Painesville, Ohio, to Madison, Ohio. Present, 9 cents; proposed 60 cents per net ton.

9199. Crushed stone. Bloomville, Ohio, to Mansfield, Ohio. Present, 70 cents per net ton; proposed, 60 cents per net ton.

9200. Sand and gravel. Kenneth and Lake Ciecott, Ind., to Darlington, Ind. Present, $1.04 per net ton; proposed, 88 cents per net ton.

9201. Crushed stone. White Sulphur, Ohio, to Orbiston, Ohio. Present, 16 cents; proposed, 90 cents per net ton.

9202. Sand and gravel. Leeland, Ind., to Warsaw, Ind. Present, 10 cents; proposed, 90 cents per net ton.

9203. Crushed stone. Bluffton, Ind., to Indiana. Present, 13 cents; proposed, 98 cents per net ton to Selma, Parker City and Farmland, Ind., and $1.01 per net ton to Winchester, Harrisville and Union City, Ind.

9204. Sand and gravel. Beesons, Ind., to Indiana. Present, 13 cents to Selma and Parker City; 13½ cents to Farmland and Winchester, and 14 cents to Harrisville and Union City, Ind. Proposed, 98 cents per net ton to Selma and Parker City and Farmland, and $1.01 per net ton to Winchester, Harrisville and Union City, Ind.

9208. Crushed stone. White Sulphur, Ohio, to Orrville, Burton City, Lawrence, Massillon and Canton, Ohio. Present, $1.10 per net ton; proposed, $1 per net ton.

9209. Sand and gravel. Deeter, Ind., to Stump Siding, Ind. Present, 78 cents per net ton; proposed, 70 cents per net ton.

9210. Crushed stone. White Sulphur, Ohio, to Delaware, Ohio, Sardinia, Ohio. Present, 50 cents per net ton, sixth class rate of 20 cents; proposed, 40 cents per net ton.

9226. Sand (other than blast, engine, foundry, glass, molding or silica) and gravel. Tecumseh, Mich., to Sylvania, Ohio. Present, 97 cents per net ton; proposed, 88 cents per net ton.

Southern Freight Association Docket

15855. It is proposed to eliminate the Class P rating on sand, gravel and crushed stone or granite, carloads, from Note 8 of Exceptions No. 3 to Agt. Dulaney's I. C. C. No. 17, specific commodity rates now having been provided for these articles.

15877. (Shipper, rate suggested by carrier.) It is proposed to establish rate of 6 cents per 100 lb., on sand and gravel, carloads, from Owensboro, Ky., to Hopkinsville, Ky., in lieu of present Class O rate of 11½ cents per 100 lb. Proposed rate made same as rates from and to other points on the L. & N. R. R. for similar distances.

15895. (Shippers, rates suggested by carriers.) Sand and gravel. Carload, from Arundel Siding, Old Dominion Siding and Ellerslie, Va., to Avon, N. C. Present rate, $2.16 per net ton (combination); proposed, $1.40 per net ton, same as rate to Grimesland and Simpson, N. C.

15013. (Shippers.) It is proposed to establish rate of $7.09 per ton of 2000 lb. on cement, carloads, from eastern points located in Groups 1, 2, 3, 5, 6 and 7, and $7.45 per ton from Group 4 to Southern Ry. stations between Charlotte, N. C., and Sumter, S. C. Groupings as per Agt. Cotrell's Cement Tariff. ICC 464. The proposed revision represents reductions, and the rates suggested are made the same as rates to ACL RR stations just south of Sumter, S. C.

15919. (Shipper.) Broken or crushed stone, carloads, from Putney, Ky., to L. & N. R. R. stations on the Kentucky & Virginia R. R. branch, Yocum Creek branch, Seagrave Creek branch and Martin's Fork branch. Class A rates now apply. It is proposed to establish rates made in line with rates from and to other points on the L. & N. R. R. for similar distances. Statement of present and proposed rates will be furnished interested parties upon request.

15929. (Shippers, rates suggested by carriers.) Stone, crushed or rubble, and stone screenings. Carloads, from Pacolet, S. C. to A. S. A. L. Ry. stations in North Carolina, located on the Hamlet Division between Wilmington and Rutherfordton, N. C., including Rutherfordton, Caroleen branch and Henrietta branch. It is proposed to establish rates on basis of joint line scale named in So. Ry. Trf. I. C. C. A9720 for actual distance from Pacolet, S. C. to S. A. L. Ry stations in question via Shelby, N. C. Proposed revision represents reductions, except to Pinoca, N. C. Present rate, $1.26; proposed, $1.31 per net ton.

15930. (Shippers.) Stone, broken, crushed or rubble. Carloads, from Rockwood, Ala., to Natchez, Miss. Present rate, $3.34 per net ton (Vicksburg, Miss. combination); proposed, $2.14 per net ton, same as rate in effect to New Orleans, Port Chalmette, Slidell, La. and Vicksburg, Miss.

15960. (Shipper, rates suggested by carrier.) It is proposed: First, to restrict the present rate of 68 cents per net ton on crushed stone and slate, carloads, from Fairmont and Bolivar, Ga., to Atlanta, Ga., to apply on interstate traffic only; second, to remove the restriction against the interstate rate of 90 cents from Whitestone, Ga., to Atlanta, Ga., permitting the rate to apply both inter- and intrastate, and, third, to establish rate of 81 cents per net ton on marble, carloads, from Canton and Tate, Ga., to Atlanta, Ga., for application on interstate traffic, in lieu of present rates of $4.50 and $5 respectively.

16033. (Shipper.) Sand and gravel. Carloads, from Carrollton, Ky., to Georgetown, Ky. Present rate, 10 cents per 100 lb. (Frankfort, Ky., combination); proposed, 8 cents per 100 lb., which reflects a differential of 1½ cents over rate from Louisville, Ky.

16010. (Shipper, rates suggested by carrier.) Sand and gravel. Carloads, from Coosada, Oktamulke, Prattville Jct., and Jackson Lake, Ala., to Linden and Nadawah, Ala. Present rate, 14 cents per 100 lb. (Class N processed under Agent Speiden's Trf. 75C); proposed, 6½ cents per 100 lb. or $1.30 per net ton, made with relation to rates in effect from and to other points on the L. & N. R. R.

16019. (Shipper.) Rates on cement. It is proposed to revise the rates on cement, carloads, from North Birmingham and Boyles, Ala., to L. & N. R. R., Memphis line stations, Jones, Tenn., to Springdale, Tenn., inclusive, to basis of 17 cents per 100 lb., the same as applicable from Leeds and Ragland, Ala. The present rates range from 18½ cents to Jones, Tenn., to 20½ cents per 100 lb. to Springdale, Tenn.

16024. (Shipper, rate suggested by carrier.) Sand and gravel. Carloads, from Louisville to Scottsville, Ky. Present rate, 19½ cents per 100 lb., or $3.90 per net ton (Class N); proposed, $1.60 per net ton, made same as rates from and to other points on the L. & N. R. R. for similar distances.

Southwestern Freight Bureau Docket

2151. Cement. To establish a rate of 22½ cents per 100 lb. to Isom, Brant and Flynn, Ark., and 23 cents per 100 lb. to Champion, Fresno, Meroney, Furth and Star City, Ark., on cement, carloads, as described in S. W. L. Trf. No. 90E, from Harrys and Eagle Ford, Texas. Shippers advise that there are no through rates on cement from Harrys, Texas, to stations on the Arkansas R. R., although Ada., Okla., takes rates of 2½ cents to 4 cents per 100 lb. under the Kansas Gas Belt and has the same rates as from Cape Girardeau, Mo., and they request basis proposed herein be established from and to the points involved.

2165. Chert and slag. To amend Item No. 10150A, of Agt. Speiden's Trf. No. 96B, naming rates on chert and slag, carloads, from Birmingham, Ala., and group to Louisiana points west of the Mississippi river to read as follows:

"Chert and slag, straight carloads, minimum weight, marked capacity of car (see note), except that cars loaded to visible capacity will be charged for at the actual weight when less than the stenciled or marked capacity, but in no case less than 40,000 lb. per ton 2000 lb."

"Note:—For marked capacity of cars, see Agt. G. P. Conard's Official Railway Equipment Register, I. C. C. R. R. P. No. 121, supplement thereto or reissues thereof."

The present description applies on chert and slag in straight or mixed carloads. It is stated that investigation develops that chert and slag are not shipped in mixed carloads and it is proposed to amend the present description to apply on shipments of straight carloads.

Western Trunk Line Docket

2251B. Lime. Carloads, from Duluth, Minn., and points taking same rates, to a few points representative of the situation:

Station—	Present Milwaukee	Present Duluth	Proposed from Duluth
Perry to			
Des Moines	19.5	23	19.5
Mason City	17	17.5	17
Marshalltown	17	21	17
Roland to Story City	19.5	21	19.5

Rates south of Marshalltown, Iowa, to be graded into rate of 23 cents now applicable to Oskaloosa, Iowa, and points east, minimum weight 30,000 lb. (by shipper).

4112. Lime. Carloads, from Duluth, Minn., and Superior, Wis., to a few representative points (rates in cents per 100 lb.):

To—	Proposed	Present
Gillette, Wis.	29.5	17
Oconto, Wis.	29.5	17
Michigamme, Mich.	29.5	17
Wausau, Wis.	20.5	14.5
Nekoosa, Wis.	23	14

Minimum weight, 30,000 lb. (by shipper).

3395B. Lime. Carloads, from Hannibal, Marblehead, Mo., and points grouped therewith, to Nekoosa, Wis. Present, 21½ cents per 100 lb.; proposed, 19 cents per 100 lb. (by shipper).

U. S. Gypsum Reaches Another New High Mark

UNITED STATES GYPSUM common moved up to a new high of 108 on the Chicago Exchange on August 24, the third successive day the price had climbed into new territory. The high figure was held at the close, leaving the stock with a net advance of 4½ points.—*Chicago Herald-Examiner.*

Building a Cement Plant in Far Off Afghanistan

Dr. C. R. Platzmann Writes of His Work in Central Asia

DEAR MR. ROCKWOOD: According to my promise I am writing to inform you of this country and its development, especially in regard to building materials, and am glad to be able to tell you something of the new cement plant to be erected near Kabul.

The machinery, consisting of a furnace-kiln, mills, a (Dorsten) press for raw material, bricks, elevators, etc., has already arrived from Germany. It was furnished by the Krupp Grusonwerke of Magdeburg. A tube mill for grinding clinker will be ordered and an installation for the automatic working of the kiln including a rotary grate. Forced draft will be used on the kiln. [It is evident from this that the European process of briquetting the raw material and fuel and burning in vertical kilns is to be employed. This is not used in the United States. It is described in ROCK PRODUCTS for December 15, 1923.—Ed.]

It took considerable time to find a suitable location for the plant, the country in the neighborhood of Kabul being deficient in limestone. On the other hand, the Ameer was anxious to have the plant near Kabul, as the cement is especially wanted for the new capital, Darulaman, and for the new irrigation works at Kuhistan, a district which is only 40 to 45 miles from Kabul, which is the capital of Afghanistan.

The chemical composition of the raw materials which have finally been found is as follows:

LIMESTONE

Silica	5.54%
Iron Oxide	1.54%
Aluminum Oxide	1.26%
Lime (CaO)	49.32%
Magnesia	0.59%
Water	0.50%
Carbon Dioxide and Ignition Loss	41.17%
	99.92%

CLAY

Silica	48.45%
Lime (CaO)	5.21%
Magnesia	5.58%
Iron Oxide	8.03%
Aluminum Oxide	18.87%
Water	3.15%
Carbon Dioxide and Ignition Loss	10.60%
	99.89%

According to the formula of Michaelis the proportion of the raw mixture results as $\frac{3.8}{1}$

According to the formula and the chemical composition of the raw materials, the burned cement will have the following composition:

Silica	22.6%
Iron Oxide	4.5%
Aluminum Oxide	7.7%
Calcium Oxide	62.6%
Magnesium Oxide	2.5%
	99.9%

The hydraulic modulus was taken relatively low (1.8) on account of the fuel supply. The Afghan coal at Ischpuschta (Bahmian mountains) is 170 miles away, not yet tested and very difficult to bring in, railroads not existing, while the coal from India is costly and of a different quality. Therefore the plant will always (or at least for a long time) be short of fuel. For this reason the burning of the cement must be carried on at as low temperature as possible and the hydraulic index is kept low, at 1.8, instead of at 2.0 which is the European practice.

The timber for building the plant is only to be found with difficulty as trees are very short in Afghanistan.

EDITORIAL NOTE: Under date of August 9, Dr. C. R. Platzmann of Berlin, Germany, whose articles on the constitution and chemistry of cements and similar subjects are familiar to ROCK PRODUCTS readers, writes this letter concerning his experience in building a cement plant in Afghanistan. The letter has unusual interest from the fact that Afghanistan, which separates India from Persia and also from Asiatic Russia, has recently been much noted in the daily papers. In a previous letter (ROCK PRODUCTS, April 5, 1924) Dr. Platzmann says that the present Ameer, Amanullah Kahn, is anxious to bring his people to a higher state of culture and it is evident that he appreciates the advance that will come from the introduction of rock products industries, which means better roads and buildings.

The power for the plant will be furnished by the Afghan Electric Works, which are between 40 and 45 miles from Kabul.

DR. C. R. PLATZMANN.

[Dr. Platzmann promises to write more of his experiences as soon as actual construction is under way.—Ed.]

Kwangtung, China, Cement Works

THE Kwangtung Cement Works at Honam, on the southern section of the city of Canton, is now being operated by a private company, the Wai Kwan Co., for the Canton Government at a guaranteed income of $364,500 a year. The plant is capable of turning out 500 barrels of cement daily; but owing to shortage of raw materials and other causes, it is now producing but 300 barrels a day in average, since the first of January this year. The cement from this local factory is being sold at about $3.60 a barrel.

Mexican Cement

THERE is very little importation of American cement into central Mexico, this region relying for its supply upon three brands of Mexican cement, manufactured in the city of Monterey and the state of Hidalgo, which at present is supplying about 95% of the local demand. The native cement is sold at from $1.50 to $1.65 per sack of 50 kilos (110 lb.). The slight demand for American cement, which is considered much finer than the native product, is for the laying of the more expensive tile, and for use in special lines of construction work for which the local product has not proven satisfactory. It is not at all likely that local conditions will change sufficiently as to create a real demand for the American product. (Consul Lee R. Blohm, Aguascalientes.)—*Commerce Reports.*

Machinery Being Installed in Trinity's Fort Worth Plant

FOUR cars of machinery, containing part of the first kiln, were received September 6, by the Trinity Portland Cement Co., at its plant just northwest of Forth Worth, Texas. Seven cars more are in transit and officials of the company are of the opinion that these contain the rest of the kiln and probably some of the crusher machinery.

The crews of the plant now are busy building the dam for the reservoir that will impound the waters of Marine creek and furnish plenty of industrial water. Others are busy raising the steel superstructure on the rock storage house.

Work is expected to start in about 30 days on the packing plant and in the meantime machinery for the mills is expected to be kept rolling in from the east, where it is made.—*Fort Worth (Texas) Press.*

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.			1.30 per net ton all sizes			
Chaumont, N. Y.	1.00	1.00	1.75	1.50	1.50	1.50
Cobleskill, N. Y.	1.35	1.35	1.25	1.25	1.25	.....
Coldwater, N. Y.			1.50 per net ton all sizes			
Columbia, Ill.	1.10	1.20	1.35	1.35	1.20	1.20
Eastern Pennsylvania	1.35	1.35	1.45	1.35	1.35	1.35
Munns, N. Y.	1.00	1.50	1.50	1.40	1.25	.....
Northern New Jersey	.....	.....	1.60	.....	.....	.....
Prospect, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Walford, Penn.	.....	1.30b	1.30b	1.40b	1.40b	1.60c
Watertown, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alton, Ill.	1.75	.....	1.75	1.50	.....	.....
Bloomville, Middlepoint, Dunkirk, Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.10	1.00	1.00
Buffalo, Iowa	.90	.....	1.25	1.05	1.10	1.10
Cypress, Ill.	1.25	1.30	1.25	1.25	1.25	1.15
Dundas, Ont.	.75	1.00	.90	.90	.90	.90
Greencastle, Ind.	1.25	1.25	1.05	1.05	1.05	1.05
Krause, Ill.	1.10	1.20	1.35	1.35	1.20	1.20
Lannon, Wis.	.85	1.10	1.10	.95	.95	.95
Linwood, Iowa	.90	.....	1.20	1.00	1.10	1.10
Northern Wisconsin	.75	.....	1.05	.95	.95	.....
St. Vincent de Paul, P. Q.	.75	1.25@1.45	1.10	1.00	1.00	1.00
Stone City, Iowa	.75	.....	.....	1.10@1.20	1.05	.....
Toronto, Canada	2.00‡	2.00‡	2.00‡	1.80‡	1.80‡	1.80‡
Valmeyer, Ill.	1.10	1.20	1.35	1.35	1.20	1.20
Waukesha, Wis.	1.15	1.15	1.15	1.15	1.15	1.15
Youngstown, Ohio	.....	.....	.....	1.50	1.60	1.60
SOUTHERN:						
Alderson, W. Va.	.75	1.75	1.75	1.60	1.50	.....
Bridgeport and Chico, Texas	1.00§	1.35a	1.30a	1.25	1.25	1.10
Cartersville, Ga.	1.50	1.50	1.50	1.00	1.00	1.00
El Paso, Texas	1.00	1.00	1.00	1.00	.....	.....
Ft. Springs, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Graystone, Ala.			Crusher run with fines out, 1.00 per net ton			
Graysville, Ga.	1.00@1.25	1.00@1.25	.....	.85@1.25	.85@1.25	.....
WESTERN:						
Atchison, Kans.	.50	2.00	2.00	2.00	2.00	1.60‖@1.80
Blue Spr'gs & Wymore, Neb.	.20	1.45	1.45	1.35@1.40	1.25@1.30	1.20
Cape Girardeau, Mo.	1 35	.....	1.25	1.25	1.00	.....
Kansas City, Mo.	1.00	1.65	1.65	1.65	1.65	1.65

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.60	1.35	1.15	1.00	.....
Cypress, Ill.	1.00@1.10	.....	.....	.....	.....	.....
Duluth, Minn.	1.00	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.75	1.75	1.75	1.75	1.75	.....
E. Summit, N. J.	1.50	2.00	1.80	1.40	1.40	.....
Eastern Maryland	1.10	1.75	1.70	1.60	1.50	1.50
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.75	1.70	1.60	1.50	1.50
Meriden, Middlefield, New Britain, Rocky Hill, Conn.	.60	1.60	1.35	1.15	1.00	1.00
Minneapolis, Minn.	1.25	.....	2.25	2.00	1.75	.....
Northern New Jersey	.....	.....	1.40	1.40	1.40	.....
Richmond, Calif.	.50*	.....	1.50*	1.50*	1.50*	.....
San Diego, Calif.	.50@ .75	1.80@1.90	1.60@1.80	1.35@1.55	1.35@1.55	1.25@1.45
Springfield, N. J.	1.60	2.00	2.00	1.75	1.75	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley and Red Granite, Wis.	1.60	1.70	1.60	1.50	1.40	.....
Eastern Penn.—Sandstone	1.25	1.65	1.60	1.40	1.40	1.25
Eastern Penn.—Quartzite	1.20	1.35	1.20	1.20	1.20	1.20
Lithonia, Ga.—Granite	.75	1.60	1.60	1.25	1.25	1.10
Lohrville, Wis.	1.65	1.65@1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@2.20
Northern New Jersey (Basalt)	150	2.00	1.80	1.40	1.40	.....

* Cubic yd. †1 in. and less. ‡Prices include 90c freight. ‖Rip rap per ton. §Dust in. (a) Dust out; (b) less 5c 10 days; (c) less 10c 10 days (2¾" to ⅝").

Agricultural Limestone
(Pulverized)

Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk **2.75**

Branchton, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers) **5.00**

Bridgeport and Chico, Texas; bulk..... **5.50**

Cartersville, Ga.—Analysis 68% $CaCO_3$, 30% $MgCO_3$; pulverized..... **2.00**
50% thru 50 mesh..... **1.50**

Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk..... **2.50**

Colton, Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk **4.00**

Dundas, Ont., Can.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$; 35% thru 100 mesh, 50% thru 50 mesh, 100% thru 10 mesh; bags, 4.75; bulk..... **3.00**

Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; sacks, $5.00; bulk..... **3.50**

Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk..... **2.50**

Knoxville, Tenn.—80% thru 100 mesh, bags, 3.95; bulk **2.70**

Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk **2.75**

Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.00; bulk **3.50**

Marion, Va.—Analysis, 90% $CaCO_3$, 2% $MgCO_3$; 42.5% thru 100 mesh, 11.3% thru 80, 20.2% thru 60, 22.8% thru 40, 3.2% thru 20 and under or 75% thru 40 mesh; pulverized, per ton..... **2.00**

Mayville Wis.—59.8% thru 60 mesh.. **2.35**

Mountville, Va.—Analysis 76.60% $CaCO_3$, 22.83% $MgCO_3$; 50% thru 100 mesh, 100% thru 20 mesh—125-lb. hemp bags..... **5.00**

Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers) **5.00**

Piqua, Ohio—Total neutralizing power 95.3%; 100% thru 10, 60% thru 50; 50% thru 100..... **2.10@ 2.25**
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.00; bulk..... **3.50**
100% thru 100, 85% thru 200; bags, 7.00; bulk..... **5.50**

Rockdale, Mass.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk..... **3.25**

Watertown, N. Y.—Analysis, 96-98% $CaCO_3$, pulverized limestone, bags, 4.00; bulk **2.00**

West Stockbridge, Mass.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk **3.25**

Agricultural Limestone
(Crushed)

Alderson, W. Va.—Analysis, 90% $CaCO_3$; 50% thru 100 mesh..... **1.50**

Alton, Ill.—Analysis 98% $CACO_3$; 50% thru 4 mesh, 3.00; 90% thru 4 mesh **1.75**

Bedford, Ind.—Analysis, 98½% $CACO_3$, ½% $MgCO_3$; 90% thru 10 mesh **1.50**

Bettendorf, Iowa—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh..... **1.50**

Blackwater, Mo.—95% $CaCO_3$; 100% thru 8 mesh..... **1.00**

Bridgeport and Chico, Texas—90% thru 100 mesh; 50% thru 100 mesh; 90% thru 50 mesh, bulk..... **2.50**
50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh; bulk..... **1.50**

Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; 90% thru 50 mesh **1.50**

(Continued on next page)

Agricultural Limestone

(Continued from preceding page)

Carthage, Mo. — Analysis, 98½% $CaCO_3$; 100% thru 10 mesh, 30% thru 100 mesh 1.75

Cypress, Ill. — Analysis, 90 to 96% $CaCO_3$; 50% thru 100 mesh, 90% thru 50 mesh, 50% thru 50 mesh.... 1.90

Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh..... 1.50

Kansas City, Mo.—50% thru 100 mesh 1.25

Krause, Columbia and Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh 1.10

Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh..... 2.00
Screenings (¼ in. to dust)..... 1.00

Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 100% thru 4 mesh; 85% thru 10 mesh; 53% thru 50 mesh; 40% thru 100 mesh bulk 2.60
32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk..... 2.25

Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind. — Analysis, 52% $CaCO_3$, 44% $MgCO_3$; meal, 100% thru 4 mesh, 35% thru 100 mesh.... .75@ 1.50

Milltown, Ind. — Analysis, 94.41% $CACO_3$, 2.95% $MgCO_3$; 30.8% thru 100 mesh .38% thru 50 mesh.... 1.45@ 1.60

Moline, Ill.—97% $CaCO_3$, 2% $MgCO_3$ —50% thru 100 mesh; 50% thru 4 mesh 1.50

Pixley, Mo.—Analysis, 96% $CACO_3$; 50% thru 50 mesh..... 1.25

River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk..... .80@ 1.40

Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh..... .75

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk..... 3.00

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated.

Glass Sand:

Berkeley Springs, W. Va..... 2.25@ 2.50
Cedarville, N. J.—Damp..... 1.75
Dry 2.25
Cheshire, Mass.:
6.00 to 7.00 per ton; bbl..... 2.50
Columbus, Ohio ..... 1.25@ 1.50
Grays Summit and Klondike, Mo..... 2.00
Los Angeles, Calif.—20-70 mesh..... 5.00
Mapleton Depot, Penn..... 2.25
Massillon, Ohio 3.00
Michigan City, Ind. ..... .50
Mineral Ridge, Ohio..... 2.50@ 3.00
Pacific, Mo. ..... 2.25@ 3.00
Pittsburgh, Pa.—Dry 4.00
Damp 3.00
Ridgway, Pa. 2.50
Rockwood, Mich. ..... 2.75@ 3.25
Round Top, Md. 2.25
San Francisco, Calif. ..... 3.00@ 3.50
St. Louis, Mo..... 1.50@ 3.00
South Vineland, N. J.—Damp..... 1.75
Dry 2.25
Thayers, Penn. ..... 2.25@ 2.50
Utica, Ill. 1.25
Zanesville, Ohio 2.50

Foundry Sand:

Albany, N. Y.:
Core 1.50
Molding fine, brass molding..... 2.25
Molding coarse 2.00
Sand blast 4.00
Arenzville, Ill.:
Core ..... .75
Molding fine ..... 1.40@ 1.60
Brass molding 1.75
Cheshire, Mass.—Furnace lining, molding fine and coarse..... 5.00
Sand blast ..... 5.00@ 8.00
Stone sawing 6.00

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Attica, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95	.....	.....	.85	.....
Erie, Penn.	.....	1.00	.....	1.25	1.50	.....
Farmingdale, N. J.	.58	.48	.85	1.10	1.10	.....
Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Leeds Jct., Maine	.....	.50	1.75	.....	1.35	1.25
Machias, N. Y.	.75	.75	.75	.75	.75	.75
Northern New Jersey	.....	.40@ .60	1.25	1.25	1.25	1.25
Pittsburgh, Penn., and vicinity	1.25	1.25	1.00	1.00	.85	.85
Washington, D. C.—Rewashed, river	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Attica, Ind.	.75	.75	.75	.75	.75	.75
Barton, Wis.	.....	.22@ .40	.20@ .40	.20@ .40	.32@ .40	.....
Columbus, Ohio.	.75	.75@1.00	.75@1.00	.75@1.00	.75@1.00	.75@1.00
Covington, Ind.	.75	.75	.75	.75	.75	.75
Des Moines, Iowa	.50	.50	1.25	1.60	1.60	1.60
	Unwashed ballast, .50 a ton; washed, .75 (none screened)					
Eau Claire, Wis.	.40	.40	.85@1.25	.....	.....	.85
Elkhart Lake, Wis.	.50	.40	.50	.50	.50	.50
Ft. Dodge, Iowa	1.00	.....	2.05	2.05	2.05	.....
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Rapids, M'ch.	.....	.50	.....	.80	.70	.70
Hamilton Ohio	.....	1.00	.....	.....	1.00	.....
Hersey, Mich.	.....	.50	.....	.....	.....	.70
Indianapolis, Ind.	.60	.60	.....	.90	.75@1.00	.75@1.00
Janesville, Wis.	.....	.65@ .75	.....	.....	.65@ .75	.....
Mason City, Iowa	.45@ .55	.45@ .55	1.35@1.45	1.45@1.55	1.40@1.50	1.35@1.45
Mankato, Minn.	.....	.50	1.35§	.....	1.35	.....
Milwaukee, Wis.	1.01	1.01	1.21	1.21	1.21	1.21
Minneapolis, Minn.*	.65	2.50†	2.00§	.....	2.00	1.75
Moline, Ill.	.60	.60	1.20	1.20	1.20	1.20
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Riton, Wis.	.40	.20	.....	.....	.40	.....
St. Louis, Mo., f. o. b. cars	1.18	1.45	1.65§	1.45	.....	1.45‖
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.60	.75	.90	.90	.85
Waukesha, Wis.	.55	.55	.75	.75	.75	.75
Winona, Minn.	.40	.40	1.25	1.25	1.10	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.			Average .58 pit			
Zanesville, Ohio	.70	.60	.60	.60	.90	.90
SOUTHERN:						
Brookhaven, Miss., Roseland La.	.....	.50	1.35	.....	.....	.....
Charleston, W. Va.	all sand 1.37 f.o.b. cars		all gravel 1.47 f.o.b. cars			
Chehaw, Ala.	1.24	1.24	.....	1.90	1.90	1.90
Estill Springs and Sewanee, Tenn.	1.00@1.25	.90	.....	.....	.85	.85
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.20
Macon, Ga.	.50	.50	.....	.75	.75	.75
New Martinsville, W. Va.	1.00	.90	.....	1.20	.....	.90
WESTERN:						
Baldwin Park, Calif.	.....	.25@ .35	.....	.....	.50@ .75	.....
Crushed rock	.90@1.10	.60@ .90	.60@ .90	.60@ .90	.60@ .90	.....
Kansas City, Mo.	Kaw river sand .75 per ton f.o.b. plants					
Los Angeles, Calif.	1.00*	1.00*	1.50*	1.50*	1.40*	1.40*
Pueblo, Colo.	1.10*	.90*	.....	1.60*	.....	1.50*
San Diego, Calif.	50@ .65	.80@ .90	1.40@1.50	1.20@1.30	1.00@1.10	1.00@1.10
Seattle, Wash. (bunkers)	1.50*	1.50*	1.50*	1.50*	1.50*	1.50*
Webb City, Mo.	.75	.75	.25@ .75b	.85b	1.25c	1.15c

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Boonville, N. Y.	.60@ .80	.....	.55@ .75	.....	.....	1.00
Brookhaven, Miss., Rosel'd, La.	.75	.50	.....	.....	1.25	.....
Chehaw, Ala.	.90@1.00	.....	.....	.....	.....	.....
Dudley, Ky.‡	1.05	1.05	.....	.95	.....	.....
East Hartford, Conn.	Sand, .65 per cu. yd.					
Elkhart Lake, Wis.	.50	.....	.....	.....	.....	.....
Gainesville, Texas	.....	.95	.....	.....	.....	55
Grand Rapids, Mich.	.....	.....	.....	.55	.....	.....
Hamilton, Ohio	.....	.....	.....	.....	.70	.....
Hersey, Mich.	.....	.....	.....	.55	.....	.....
Indianapolis, Ind.	Mixed gravel for concrete work, .65					
Lindsay, Texas	.....	.....	.....	.....	.....	.55
Macon, Ga.	.35	.....	.....	.....	.....	.....
Mankato, Minn.	Pit run gravel, .60					
Moline, Ill.	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Montezuma, Ind.	.....	.....	.....	.....	.....	.60
St. Louis, Mo.	Mine run gravel 1.55 per ton					
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.....	.....	.....	.....	.....
York, Penn.	1.10	.....	.....	.....	.....	.....
Zanesville, Ohio	.60	.60	.....	.....	.....	.....

*Cubic yd.; †roofing gravel; §⅝ in. and less; ‡crushed rock; ‖2½ in. and less; (a) ¼ in. and less; (b) flint chats; (c) crushed flint.

Miscellaneous Sands

(Continued from preceding page)

Columbus, Ohio:		
Core	.25@	.30
Furnace lining		2.50
Molding fine		2.00
Molding coarse	1.50@	2.00
Sand blast	3.00@	4.00
Stone sawing		1.50
Traction	.30@	.65
Brass molding	2.00@	2.50
Dresden, Ohio:		
Core		1.25
Furnace lining, brass molding		1.50
Molding fine and coarse	1.25@	1.50
Traction		1.00
Dunbar, Penn.:		
Traction (damp)		2.00
Eau Claire, Wis.:		
Roofing sand	3.25@	4.25
Sand blast		3.25
Core		1.25
Elco, Ill.:		
Ground silica per ton in carloads	20.00@	31.00
Estill Springs and Sewanee, Tenn:		
Molding sand		1.40
Grays Summit, Mo.:		
Molding fine	1.75@	2.00
Kasota, Minn.:		
Stone sawing		1.25
Klondike, Mo.:		
Molding fine	1.75@	2.00
Los Angeles, Calif.:		
Roofing sand—stucco material, 8-12 and 12-20 mesh		6.00
Mapleton Depot, Penn.:		
Molding fine		2.25
Traction		2.00
Massillon, Ohio:		
Molding fine, coarse, furnace lining and core, traction		2.50
Michigan City, Ind.:		
Core	.50@	.55
Traction		.40
Minera' Ridge and Ohlton, Ohio:		
Furnace lining, molding fine (both green)		1.75
Molding coarse, roofing sand, sand blast, stone sawing, traction (all green)		2.00
Montoursville, Penn.:		
Core	1.25@	1.50
Traction		1.25
New Lexington, Ohio:		
Molding fine		2.00
Molding coarse		1.50
Ottawa, Ill.:		
Crude silica sand	.75@	.85
Core		1.50
Sand blast		2.50
Pacific, Mo.:		
Core, furnace lining	1.00@	1.25
Molding fine	.90@	1.00
Stone sawing	1.00@	1.75
Molding coarse	.85@	1.00
Ridgway, Penn.:		
Core		2.00
Furnace lining, molding fine, molding coarse		1.25
Traction		2.25
Round Top, Md.:		
Core		1.60
Building sand		1.00
Traction		1.75
St. Louis, Mo.:		
Core	1.00@	1.75
Furnace lining		1.50
Molding fine	1.50@	2.50
Molding coarse	1.25@	1.75
Roofing sand		1.75
Sand blast	3.50@	4.50
Stone sawing	1.25@	2.25
Traction		1.25
Brass molding	2.00@	3.00
San Francisco, Calif.:		
(Washed and dried)—Core, molding fine, roofing sand and brass molding	3.00@	3.50

Crushed Slag

City or shipping point	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in. and less	2½ in. and less	3 in. and larger
EASTERN:							
Buffalo, N. Y.	2.25	1.25	1.25	1.25	1.25	1.25	1.25
E. Canaan, Conn.	3.00	1.00	2.25	1.25	1.25	1.15	1.15
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05	1.45	.....	1.45	1.45	1.45	.....
Jackson, Ohio	.....	1.30	.....	1.30	1.30	1.30	.....
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngstown, Dover, Hubbard, Leetonia, Struthers, O.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	1.55	.....
Ensley and Alabama City, Ala.	2.05	.80	1.25	1.15	.90	.90	.80
Longdale, Goshen, Glen Wilton, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.30
Buffalo, N. Y.	.....	.....	.....	12.00	.....	.....	.....	.....
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00a	.....
West Stockbridge, Mass.	.....	10.50	6.001	.....	.....	.....	.....	3.25m
Williamsport, Penn.	.....	.....	10.00	.....	.....	.....	6.00	.....
York, Penn.	.....	10.50	10.50	11.50	.....	.....	8.50	1.65i
CENTRAL:								
Cold Springs, Ohio	.....	9.50	9.50	.....	.....	.....	9.00	1.60
Delaware, Ohio	12.50	9.00	9.00	10.00	.....	.....	9.00	1.60
Gibsonburg, Ohio	12.50	.....	9.50	.....	9.00	11.00	9.00	.....
Huntington, Ind.	.....	9.50	9.50	.....	9.00	.....	8.50	1.50b
Luckey, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	.....
Marblehead, Ohio	.....	9.50	9.50	.....	.....	.....	8.50	1.50c
Marion, Ohio	.....	9.50	9.50	.....	.....	.....	8.50	1.70j
Mitchell, Ind.	.....	12.00	12.00	12.00	11.00	.....	10.00	1.70e
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	9.00	11.00	.....	.....
Woodville, Ohio	12.50†	9.50†	8.50†	.....	9.00	.....	9.00	1.60
SOUTHERN:								
Erin, Tenn.	.....	.....	.....	.....	.....	.....	8.50	1.40*
El Paso, Texas	.....	.....	.....	.....	.....	.....	14.00	2.00
Graystone, Ala.	12.50	11.00	.....	11.00	.....	.....	8.50	1.50k
Karo, Va.	.....	10.50	9.00	.....	.....	.....	7.00g	1.65h
Knoxville, Tenn.	22.00	11.00	.....	11.00	.....	.....	8.50	1.50
Staunton, Va. (boss lime)	.....	.....	.....	.....	.....	.....	.....	1.30
Varnons, Ala. (f)	11.00	11.00	11.00	11.00	9.00	11.00	8.50	15.00
Zuber and Ocala, Fla.	14.00	12.00	10.00	.....	.....	.....	11.00	1.60
WESTERN:								
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	12.50h	.....
San Francisco, Calif.	22.00	22.00	15.00	22.00	.....	.....	.....	2.50
Tehachapi, Calif.	.....	.....	.....	.....	.....	.....	13.00	2.00d

*And 1.50; †50-lb. paper bags; (a) F. O. B. Kilns; (b) wooden bbl.; (c) wooden, steel 1.70; (d) to 2.15; (e) 180-lb. wooden bbl.; (f) dealers' prices; (g) to 9.50; (h) to 1.75; (i) 200 lb. bbl.; 2.65, 300 lb. bbl.; (j) steel; (k) jute bags, 1.35; (l) bags; (m) finishing lime, $2.50 common.

Miscellaneous Sands

(Continued)

San Francisco, Calif. (Direct from Pit)		
Furnace lining, molding coarse, sand blast		3.60
Stone sawing, traction		2.30
Tamalco, Ill.:		
Molding coarse	1.40@	1.60
Brass molding		1.75
Tamms, Ill.:		
Ground silica per ton in carloads	20.00@	31.00
Thayers, Penn.:		
Core		1.90
Molding fine and coarse		1.25
Traction		2.25
Utica, Ill.:		
Core, furnace lining, molding fine and coarse	.60@	1.25
Roofing sand, traction		1.25
Sand blast		2.50
Stone sawing	.80@	2.50
Brass molding	.75@	1.25
Utica, Penn.:		
Core, molding fine, brass molding		2.00
Molding coarse	1.50@	1.75
Warwick, Ohio.:		
Core, molding fine and coarse (all green) 1.75; all dry		2.50
Traction		2.50
Furnace lining (green)		1.75
Zanesville, Ohio:		
Sand blast, core, traction		2.50
Molding fine		2.00
Molding coarse		1.50
Furnace lining		2.25
Brass molding		2.00

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:		
Crude talc (mine run)	3.00@	4.00
Ground talc (20-50 mesh), bags		10.00
Cubes		55.00
Blanks (per lb.)		.08
Pencils and steel workers' crayons, per gross		1.25
Chatsworth, Ga.:		
Crude (for grinding)		6.00
Ground (150-200 mesh, bags)		12.00
Pencils and steel workers' crayons	1.25@	2.50
Chester, Vt.:		
Ground (20-70 mesh)	7.00@	8.00
E. Granville, Rochester, Johnson, Waterbury, Vt.:		
Ground talc (20-50 mesh) bags	7.00@	10.00
Ground talc (150-200 mesh) bags	10.00@	25.00
Pencils and steel workers' crayons, per gross	.75@	2.00
Emeryville, N. Y.:		
(Double air floated) including bags; 200 mesh, 13.75; 325 mesh		14.75
Hailesboro, N. Y.:		
Ground (150-200 mesh) bags		18.00
Henry, Va.:		
Crude talc (mine run) per 2000-lb. ton	2.75@	3.50
Ground (150-200 mesh), bags	8.50@	14.00
Joliet, Ill.		
Ground (150-200 mesh) bags	28.00@	30.00
Keeler, Calif.:		
(150-200 mesh); carloads, 30 tons or more (bags extra)	20.00@	30.00
Marshall, N. C.:		
Crude	4.00@	8.00
Ground (20-50 mesh), bags extra	6.50@	8.50
Ground (150-200 mesh), bags	8.00@	12.00
Natural Bridge, N. Y.:		
Ground talc (300-325 mesh), 200-lb. bags	13.00@	15.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Centerville, Tenn.—B.P.L. 65%, bags		8.50
Bulk		6.50
Gordonsburg, Tenn.—B.P.L. 65-70%	4.00@	5.00
Mt. Pleasant, Tenn.—B.P.L. 72%	5.50@	6.00
13% phosphoric acid, 95% thru 80 mesh		5.75
75% hand mined	6.50@	6.75
75% washed over ¼-in. screen		6.75
75% max. 5½% I and A	6.50@	7.00
78% max. 4½% I and A		8.00
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.		5.50
Twomey, Tenn.—B.P.L. 65%	7.00@	8.00

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Clay Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12	$10.20	$10.00	$8.10	$7.80
24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.80	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10	12.60	11.00	8.70	8.75
18x10	12.60	11.00	8.70	8.75
18x 9	12.60	11.00	8.70	8.75
16x10	12.60	11.00	8.40	8.75
16x 9	12.60	11.00	8.40	8.75
16x 8	12.60	11.00	8.40	8.75
18x12	12.60	11.00	8.70	8.75
16x12	12.60	11.00	8.40	8.75
14x10	11.10	11.00	8.10	7.80
14x 8	11.10	10.50	8.10	7.80
14x 7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

Ground Rock

Mt. Pleasant, Tenn. — B.P.L. 65%, 2000 lb.	6.50@ 7.00
Twomey, Tenn.—B.P.L. 65%	7.00@ 8.00

Florida Soft Phosphate

(Raw Land Pebble)

Per Ton

Florida—F. O. B. mines, gross ton, 68/66% B.P.L.	2.25
70% min. B.P.L.	2.50
72% min. B.P.L.	2.75
75/74% B.P.L.	3.75

Fluorspar

Fluorspar—80% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	18.00@19.00
Fluorspar—85% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	19.00@20.00

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars		10.50
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries		17.50
Crown Point, N. Y.—Mica Spar		7.00@ 8.00
Easton, Penn.—Slate granules		7.00@ 7.50
Haddam, Conn.—Felstone buff	12.00	12.00
Harrisonburg, Va.—Blk. marble (crushed, in bags	14.50@22.50	14.50@22.50
Ingomar, Ohio (in bags)		20.00
Middlebrook, Mo.—Red		25.00@30.00
Milwaukee, Wis.		14.00@34.00
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Poultney, Vt., 2000 lb.		6.12
Phillipsburg, N. J.—Evergreen, bulk	8.00@10.00	8.00@10.00
Creme and royal, bulk	15.00@20.00	15.00@20.00
Red Granite, Wis.		7.50
Sioux Falls, S. D.	7.50	7.50
Stockton, Cal.—Crushed quartz, red rock, greenstone, jasper, sacks		*10.00
Tuckahoe, N. Y.—2000 lb.		12.00@20.00
Wauwatosa, Wis.		16.00@34.00
Whitestone, Ga.—White marble chips, net ton in bulk, f.o.b. cars, granite	4.50@ 6.00	4.50@ 6.00

*LCL, 10% higher.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	
Baltimore, Md.	15.00	24.00
Ensley, Ala. ("Slagtex")	12.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Omaha, Neb.	18.00	30.00@40.00
Philadelphia, Penn.	15.75	21.50
Portland, Ore. (del. loc.)	21.00	30.00@100.00
Prairie du Chien, Wis.	14.00	21.50@30.00
Puyallup, Wash.	20.00	30.00@90.00
Rapid City, S. D.	18.00	25.00@40.00
Salem, Ore.	23.00	50.00
Seattle, Wash.	22.00	40.00
Watertown, N. Y.	21.00	35.00
Wauwatosa, Wis.	14.00@18.00	30.00@42.00
Winnipeg, Can.	15.50	

Sand-Lime Brick

Prices given per 1000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	15.00@16.50
Dayton, Ohio	12.50@13.50
Grand Rapids, Mich.	11.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.00
Michigan City, Ind.	11.00
Milwaukee, Wis. (delivered)	13.50
Plant City, Fla.	10.00@11.00
Portage, Wis.	15.00
Rochester, N. Y.	19.75
Saginaw, Mich.	12.00
San Antonio, Tex.	12.50@13.50
Syracuse, N. Y. (delivered at job)	20.00
F.o.b. cars	18.00

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrated, Finishing	per ton Common
Atlanta, Ga.	22.50	14.00
Baltimore, Md.	24.25	17.85
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	18.00
Dallas, Tex.	20.00	.....
Denver, Colo.	24.00	.....
Detroit, Mich.	22.00	20.00
Minneapolis, Minn. (white)	25.50	21.00
Montreal, Que.	.....	21.00
New York, N. Y.	18.20	13.10
St. Louis, Mo.	24.00	20.00
San Francisco, Calif.	22.60	.....
Seattle, Wash. (paper sacks)	24.00	.....

Portland Cement

Prices per bbl. and per bag net in carload lots.

	Per Bag	Per Bbl.
Albany, N. Y.	.....	2.62
Atlanta, Ga.	.....	2.35
Boston, Mass.	.....	2.53@3.03†
Buffalo, N. Y.	.....	2.38@2.88†
Cedar Rapids, Iowa	.61	2.44
Cincinnati, Ohio	.61¼	2.47
Cleveland, Ohio	.59¾	2.39
Chicago, Ill.	.55	2.20
Columbus, Ohio	.....	2.44
Dallas, Texas	.53¾	2.15
Davenport, Iowa	.59¼	2.39
Dayton, Ohio	.....	2.48
Denver, Colo.	.63¾	2.55
Detroit, Mich.	.60	2.40
Duluth, Minn.	.54¾	2.19
Indianapolis, Ind.	.60¼	2.41
Kansas City, Mo.	.54¼	2.47
Los Angeles, Cal. (less 5c dis.)	.65	2.83
Memphis, Tenn.	.....	2.60
Milwaukee, Wis.	.58¼	2.35
Minneapolis, Minn.	.60½	2.42
Montreal, Canada (sks. 20c ext.)	.....	1.90b
New Orleans, La.	.....	2.40
New York, N. Y.	.....	2.15@2.65†
Philadelphia, Penn.	.....	2.41@2.81†
Phoenix, Ariz.	.82½	3.30
Pittsburgh, Penn.	.54¾	2.19
Portland, Ore.	.....	3.05
San Francisco, Cal.	.....	2.61*
St. Louis, Mo.	.57½	2.30
St. Paul, Minn.	.60½	2.42
Seattle, Wash. (10c bbl. dis.)	.....	2.90
Toledo, Ohio	.61¼	2.45

NOTE—Add 40c per bbl. for bags.
*5c cash disc. 10 days.
†Prices to contractors, including bags.
(b) Less 10c 20 days.

Mill prices f. o. b. in Carload Lots to Contractors

	Per Bag	Per Bbl.
Buffington, Ind.	.48¾	1.95
Concrete, Wash.	.....	2.60
Dallas, Texas	.....	2.10
El Paso, Tex.	.70	2.08*
Hannibal, Mo.	.....	2.05
Hudson, N. Y.	.....	2.05
Leeds, Ala.	.....	1.95
Los Angeles, Calif.	.....	2.65
Louisville, Ky.	.....	2.35
Northampton, Penn.	.....	1.95
Phoenix, Ariz.	.....	4.30†
Steelton, Minn.	.50	2.00
Universal, Penn.	.58¾	2.35

*Gross, 10c sacks and 10c per bbl. disc 10 days
†Gross, 15c sacks and 5c per bbl. disc. 10 days.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	Plaster Board ¼x32x36" Weight 1500 lb. Per M Sq. Ft.	Plaster Board ⅜x32x36" Weight 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48" Lengths 6'-10', 1850 lb. Per M Sq. Ft.
Agatite, Texas (a)	.....	.....	6.00	10.00	10.00	10.50	10.00	.....	19.00	.....	.....	.....	.....
Akron, N. Y. (a)	3.00	4.00	6.00	10.00	10.00	10.00	20.20	7.00@9.00	27.35	21.00	19.375	20.00	30.00@32.00
Black Hawk, S. D.	3.50	.....	7.00	10.00	10.00	10.50	.....	.....	.....	.....	.....	.....	.....
Blue Rapids, Kans. (a)	2.50	4.00	6.00	10.00	10.00	10.50	10.00	.....	23.15	19.00	19.375	20.00	.....
Denver, Colo.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Douglas, Ariz.	.....	.....	6.00	.....	15.00	.....	.....	.....	.....	15.50	.....	.....	.....
Ft. Dodge, Iowa (a)	2.50	4.00	6.00	10.00	10.00	10.50	15.45	.....	22.70	20.00	19.375	20.00	30.00
Grand Rapids, Mich.	2.75	.....	6.00	10.00	10.00	10.00	.....	.....	.....	.....	.....	.....	.....
Gypsum, Ohio (a)	2.75	4.00	6.00	10.00	10.00	10.00	19.25	7.50	26.85	19.00	19.375	20.00	30.00
Port Clinton, Ohio	3.00	4.00	6.00	8.00	10.00	10.00	20.00	7.50	30.15	20.00	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	.....	.....	15.40*	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	.....	.....	.....	.....	28.50	.....	35.00

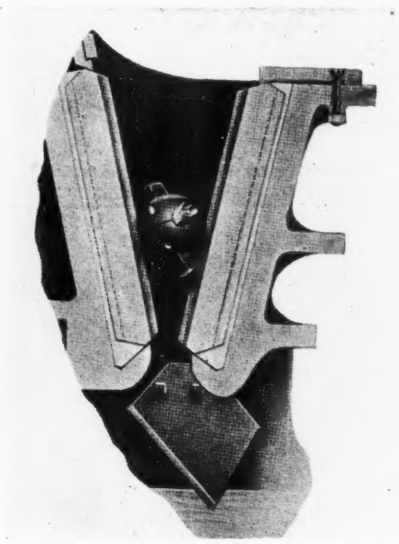
NOTE—Returnable Bags, 10c each; Paper Bags $1.50 per ton extra (not returnable).
*Including sacks at 15c each; (a) prices are net of bags.

New Machinery and Equipment

A Hammer Guard to Save Rock Crushers

ONE of the commonest ways in which a rock crusher is broken is the falling of a hammer head into the jaws. The device shown in the cuts prevents this so far as the hammers used around the rock crusher for sledging big pieces are concerned.

Rubber hammer guard bolted in place on the hammer



The rubber ball compresses and does not break the jaws

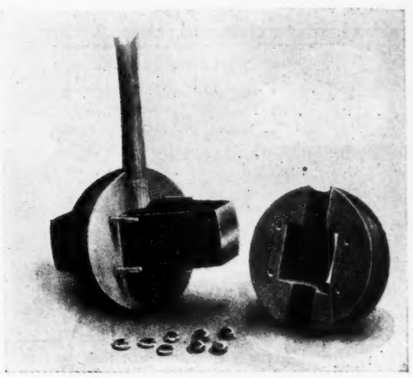
The device is a ball of rubber cut in two so that it can be bolted over the hammer and handle but leaving the breaking faces clear. If the handle breaks and the hammer head falls into the crusher, the jaws merely compress the rubber and the crusher is not broken. The device is made by the Road Builders' Equipment Co., Portland, Ore.

Sullivan Portable "100-Ft." Air Compressor

THE rapid increase in the applications of compressed air for many outdoor purposes has called for the development of portable air compressors in a variety of types and capacities. The machine shown in the illustration is the new Sullivan 103-ft. gasoline engine driven portable unit. This is a size and type which past experience has proved to be popular and to be adapted to many purposes.

This new Sullivan compressor is known as the WK-311 type. It is direct connected to a Buda four-cylinder, four-cycle gasoline engine and has a rating of 17 hp. for this duty. The compressor is a vertical two-cylinder, single acting, single stage unit, designed especially for this service. Lubrication is automatic and cooling water for the engine and compressor are supplied by a circulating pump in the same system. The air valves are the well known Sullivan "wafer" type, which the manufacturer claims are characterized by simplicity, strength, low clearance losses and quietness in action. The compressor, engine and equipment are mounted on a one-piece steel casting of rigid construction. The 12-gallon gasoline tank and the 12x48-in. air receiver are carried horizontally in cradles at the rear of the truck body, and all working parts of the compressor are protected when not in use by sheet steel sides which are locked in place against the base and the steel canopy top, protecting the outfit from the weather and from theft of equipment.

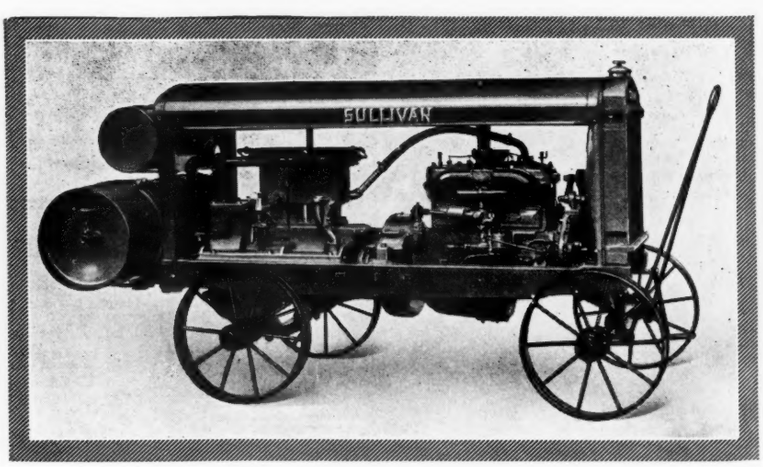
The machine is ordinarily mounted on a steel wheel truck for highway use, weighing 3235 lb. in this form. It may, however, be mounted on a trailer truck with rubber tires for use on city streets or on a wooden skid if maximum portability is not necessary. The machine may also be set on a Ford truck using the No. 9 Olson extension with longitudinal spring supports. A new bulletin, No. 77-L, will be sent at request.



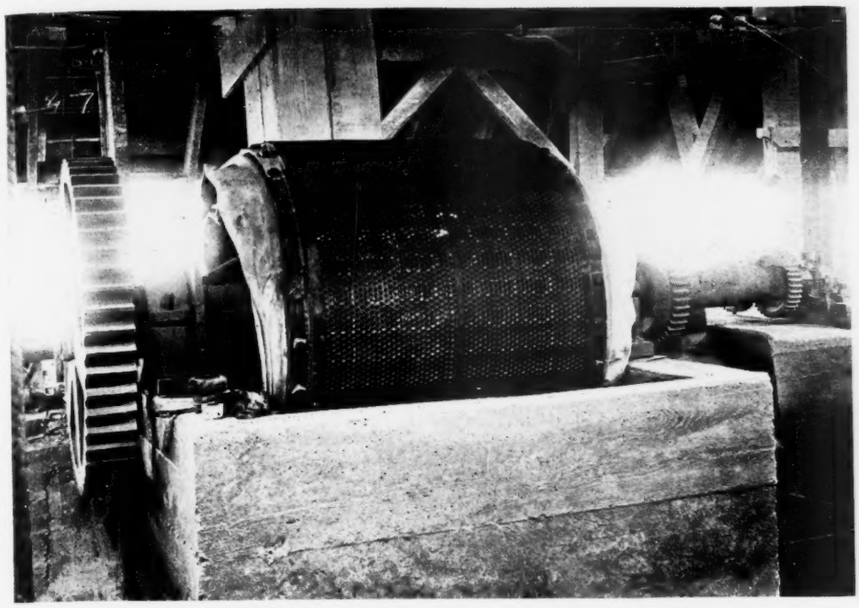
Showing the method of attaching guard to hammer

A Screening Ball Mill

THE Braun Corporation of Los Angeles, Calif., has placed a ball mill on the market which carries its own device for separating the ground product from that which is insufficiently ground. It is called the Herman mill and the shell is com-



The Sullivan "100-ft." portable air compressor mounted on a truck with engine, gasoline tank and air receiver



Herman screening ball mill which discharges through grids and an outside screen which the makers say will not clog

posed regularly of three parts: Innermost is a sectional lining of reversed grizzly grids of manganese steel; surrounding the grids is a punched metal screen of 3/16-in. boiler sheet in two sections, rolled to correct circle, providing a smooth exterior surface, which is encircled by the fine or finishing screen, provided with end pull take-ups. Heavy felt gaskets under the end bands keep the mill leak-proof, so that discharge is confined to the meshes of the screen. There is no oversize in the Herman discharge.

The makers claim that the mill positively will not clog. They also claim a very low consumption of steel both in the liners and the chrome steel balls which are used as a grinding medium.

Shovel Attachment to Fordson Tractor

THE MANDT CO. of Keokuk, Iowa, have placed on the market an adaptation of a Fordson standard tractor which should be interesting to producers and handlers of sand and gravel, crushed stone, etc. It consists of the standard Fordson unit with several attachments which convert the machine into a ¼-yd. shovel, a ½-yd. shovel, or a goose neck crane.

The accompanying picture shows the ¼-yd. shovel in action. It will be noted that the shovel attachment is built entirely of structural steel members. The steel superstructure is rigidly fastened to the frame and axles of the tractor, and is so designed that the main frame of the machine takes up the digging strain. The bucket on the ¼-yd. size is 40 in. wide and 22 in. deep, and the bottom of the bucket is of heavy steel plate. The shovel is filled by being pushed into the pile by the tractor and then raised by applying the power of the engine to the raising device. This power is transmitted through a pair of sprockets and chain. The raised shovel with load is then swung around by means of a bull wheel. A tipover bucket is used.

The makers claim that the average time required to dig, load, raise shovel, swing and dump is about 13 seconds. It will load sand at the rate of a yard a minute, or crushed stone at the rate of a yard in three or four minutes, depending on the operator. The ¼-yd. size is recommended by the manufacturer for general use. Digging teeth may be used if desired.

The goose neck crane attachment consists of two long steel arms, pulleys, and hook. It will handle 1500 lb., raising the load 9 ft.

Improvements in Pawling and Harnischfeger Small Excavators

THE Pawling & Harnischfeger Company announce that they are now equipping all of their ½-yd. and ¾-yd. capacity excavators with a specially designed all-steel cab, which not only gives the machine neatness of appearance, but assures the complete protection of all the main machinery against inclement weather and tampering. This cab is provided with windows on each side so that the operator may be protected from the cold or dampness and yet efficiently operate the machine. A swinging steel door is placed at each side to give access to all parts of the machinery. These doors are provided with latches and may be locked. The windows are protected by sheet steel covers which may be slipped into place when the machine is not being used.

Another new feature that is being used on all P. & H. Model 206 machines is the ¾-yd. struck measure dipper. The use of this dipper substantially increases the output of this machine. The machines using ¾-yd. heap measure dippers have established good performance records and it is now expected that some new records will be set by these larger capacity machines.

This Model 206 has increased capacity ratings in accordance with increased dipper capacity. After tests of operation in the field, the makers found that ratings of this model had been under the requirements for safety and so new ratings are now given for the various boom lengths as follows:

Radius, ft.	Capacity, lb.
10	22,000
15	13,000
20	8,800
25	6,500
30	5,100
35	4,100

These ratings are all based on 75% of the overturning load.

Shovel attachment to Fordson tractor

News of All the Industry

Incorporations

Canadian Lime Co., Ltd., Three Rivers, Que., has been incorporated.

Consolidated Crushed Rock, Ltd., Montreal, Canada, has been incorporated.

Flint Gravel Co., 2225 Bonbright street, Flint, Mich., has been incorporated for $45,000.

Cote and Simard, Lachine, Quebec, manufacturers of concrete blocks, have been registered.

Tallahatchie Gravel Co., Sardis, Miss., has been incorporated for $15,000 by K. E. Taylor, C. U. Irvine, and M. F. West.

Miami Sand and Rock Co., Miami Beach, Fla., has been incorporated for $20,000. W. Raymond Calloway, president; Paul J. Rutan, secretary.

Great West Sand and Gravel Co., Winnipeg, Man., Canada, has been registered by Harold G. Hutchings, 112 Market avenue, Winnipeg, Canada.

Holmes Sand Co., Cleveland, Ohio, has been incorporated for $25,000 by M. R. Mendel, Robert L. Carr, E. Brudno, Paul R. Brown and M. L. Stanton.

Florida General Phosphate Co., Dover, N. Y., has been incorporated for $1,200,000 to mine, quarry, excavate and sell phosphate rock and other mineral deposits.

Raleigh Sand Supply Co.. Raleigh, N. C., has been incorporated for $10,000, by S. J. Busbee, Mrs. S. J. Busbee and Mrs. C. L. Jenkins, all of High Point, N. C.

Madison Sand and Gravel Co., Youngstown, Ohio, has been incorporated for $50,000 by C. F. Smith, T. Lamar Jackson, N. A. Emery, David E. Jones and C. Kenneth Clark.

Fasig Cement Co., Anna, Ill., has been incorporated for $250,000 to operate a cement mill. Incorporators: Daniel H. Oskin. John C. McGinnis and Fred Magaw, all of Anna.

North Side Block Co., Milwaukee, Wis., has been incorporated for $20,000 to manufacture concrete blocks, etc. Principal incorporator: James Bowler, 250 Farwell avenue, Milwaukee.

Straub Block Co., New Kensington, Penn., has been incorporated for $50.000 to manufacture concrete tile, concrete blocks and kindred products. Frank S. Moran, New Kensington, is treasurer.

Union Stone Co., Salisbury, N. C., has been incorporated for $15,000 to operate quarries, sell and acquire lands, etc. Incorporators: L. S. Bradshaw, C. J. and G. M. Lyerly, all of Salisbury.

White Portland Cement Co., Los Angeles, Calif., has been incorporated for $3,000,000 by L. V. Bentley, C. J. Rhoades, C. H. Shattuck, W. B. Wilkerson, I. C. Ellis, T. H. Cannan and L. Cruikshank.

Sommer Cement Products Co. has been incorporated under the laws of Delaware for $100,000 by M. M. Lacey, M. B. Reese and L. S. Dorsey, to manufacture concrete blocks. (Colonial Charter Co., Wilmington.)

Doylestown Concrete Brick and Block Co., Doylestown, Penn., has been incorporated for $50,000 to manufacture concrete blocks, brick, etc. Robert C. Wood, Doylestown, is treasurer and representative.

Reamix Corp., Milwaukee, Wis., has been incorporated for $10,000 to manufacture and prepare cement mortar and other building materials. Incorporators: Josephine L. Johnson, Sidney S. Duffie and Walter E. Pugh.

Pioneer Silica Products Co., St. Louis, Mo., has been incorporated for $25,000 to operate silica properties, commercial reduction plants, etc. Incorporators: T. R. Reyburn, J. B. Bergs and A. H. Sullivan, Arcade Bldg., St. Louis.

Edgewood Concrete Products Co., Springfield, Mass., has been incorporated for 50 shares of stock of no par value, to manufacture concrete blocks, brick, etc. President and treasurer, David A. Reed, 131 Edgewood Gardens, Springfield.

Sand and Gravel

Delaware Sand and Gravel Co., Muncie, Ind., has increased its capital from $25,000 to $30,000.

Service Rock and Gravel Co., Fresno, Calif., was admitted to membership in the Fresno Builders' exchange at a luncheon meeting of directors recently.

Wear Sand Co., Topeka, Kans., has moved its offices from the first floor of the Smith Bldg. to new quarters at the corner of Harrison and Crane streets.

Tombigbee Gravel and Sand Co., Columbus, Miss., incorporation notice of which appeared in August 9 Rock Products, is building a spur track and developing a gravel plant 18 miles east of Tupelo, Miss.

Quarries

L. B. Wilcox & Co., are establishing a rock crusher at Rainier, Ore.

Gilbert Donaldson's rock crusher at Boise, Idaho, has been reported damaged by fire to the extent of $3000.

Dow F. Stanfield and Elliott Hastings, Winchester, Calif., have acquired the patents for the Mitchell rock crucher, and will erect a factory in Winchester.

Wissota Sand and Gravel Co., 419½ South Barstow street, Eau Claire. Wis., has purchased limestone quarry at Elmwood and will install a large crushing plant, planning a daily output of 1000 tons, according to reports. W. H. Rowe, Eau Claire, Wis., is general manager of the company.

Lime

White Crystal Lime Co., Ltd., Regina, Sask., has been reported dissolved.

Culver City Lime Co., Culver City, Los Angeles, Calif., has filed plans for the erection of a new one-story plant at 6505 Featherstone drive, Sawtelle Annex, to be 40x135 ft., for which foundations will be laid at once.

Gypsum

Ingonish Gypsum Co., Ingonish, Cape Breton, Nova Scotia, has built a new power plant and shipping pier costing approximately $60,000.

United States Gypsum Co., Chicago, Ill., has purchased the Cheboygan sawdust mountain for the purpose of manufacturing wall board, it is reported.

Plastergen Wall Board Co., 190 Philadelphia street, Buffalo, N. Y., manufacturer of plaster board products, has taken out a permit to build a one-story addition to its plant, 25x126 ft.

Newark Plaster Co., Ottawa Brook, Nova Scotia, owned by the Newark Plaster Co. of Newark, N. J., has had a busy year, according to reports. The market for the product of this company is in the United States.

Iona Gypsum Co., Iona, Nova Scotia has a large order for plaster and hard wall plaster from some of the big construction companies in Newfoundland. This plant is reported as having had a busy season, and reports the outlook good for the rest of the year.

Concrete Products

Otto Nelson has installed a concrete block-making machine at the Nelson gravel pit near Ely lake, Eveleth, Minn.

Dominion Concrete Co., Ltd., Kemotville, Ont., Canada. manufacturer of concrete tile and sewer pipe, nad its plant damaged by fire recently.

American Land and Irrigation Co., Mercedes, Texas, is reported to be erecting a factory for the manufacture of concrete tile to cost about $15,000. Harry Seay, Weslaco, Texas, is president.

Houghten Cement Block Co., 10804 Devine street, Detroit, Mich., has completed plans for the construction of a new one-story addition, to include the installation of equipment for considerable increase in output.

Florence Concrete Products Co., Commerce street, Florence, Ala., will soon begin the erection of a one-story plant for the manufacture of concrete blocks and kindred cast products. J. L. Buffler is president.

Escambia Sand and Gravel Corp., Flomaton, Ala., is said to have tentative plans under advisement for the construction of a new one-story works for the manufacture of concrete pipe, estimated to cost close to $25,000 with equipment.

Carolina Dunntile Co., West Washington street, Kinston, N. C., recently organized, has commenced the erection of a one-story plant, 50x100 ft. to be equipped for the manufacture of concrete tile, culverts and kindred products. M. L. Shealy is secretary-treasurer.

Ideal Cement Stone Co., Omaha, Neb., of which Nels J. Peterson is president, is making extensive improvements and enlargements at its south plant, 26th and Oak streets. The company has erected some substantial buildings fully equipped and running at full capacity in the manufacture of concrete blocks. The new plant turns out 3000 blocks a day and the north plant, at 31st and Spaulding streets, produces about the same. Improvements at the south plant will cost the company about $20,000.

Pleasantville Concrete Products Co., Pleasantville. N. J., A. J. Milliken, president, has acquired the local concrete block manufacturing plant of the Coral Gables Co., Miami, Fla., for a consideration stated at $95,000. The new owner will take possession in the fall and plans for immediate enlargements, with the installation of additional machinery to double, approximately, the present output. New departments will be established for the manufacture of concrete blocks and other pressed specialties.

Silica Sand

Pennsylvania Plate Glass Corp., Durant City, Penn., recently organized, is making ready to commence the construction of its proposed new plant for the production of sheet glass products on local tract of land. It will consist of a number of buildings, with power house, designed tor an initial output of about 450,000 ft. per month, giving employment to close to 500 operatives. The estimated cost is placed in excess of $650,000, with machinery.

Slag

Birmingham Slag Co., Birmingham, Ala., will rebuild its main screening plant at Gadsen, burned at loss of $35,000.

Standard Slag Co., Youngstown, Ohio, whose plant at Jackson was partially destroyed by fire some weeks ago, is to rebuild with a modern steel structure not quite so large but with a greater capacity, it is stated.

Agstone

Nevis, Minn.—Alfalfa growers in this section will benefit by the opening of a marl bed on the Frost farm here.

Slate

Washington Slate Quarry, Slatington, Penn., has been leased by E. L. Krause and John J. Paules, and will resume operations.

Personal

Ernest Ashton, chemical engineer for the **Lehigh Portland Cement Co.**, Allentown, Penn., sailed for Europe, recently, on a business trip. He will be gone five weeks.

Obituary

Otto Hoffarth, for 35 years in the employ of the **San Antonio Portland Cement Co.**, died Sept. 3. At the time of his death Mr. Hoffarth was superintendent of the plant.

Manufacturers

Dings Magnetic Separator Co., Milwaukee, Wis., announces that its Birmingham, Ala., office, in charge of H. M. Gassman, has been removed to 513 North 21st street.

Smith Engineering Works, Milwaukee, Wis., has announced the removal of its New York district office from 50 Church street, to 18 East 41st street, New York City.

Stephens-Adamson Manufacturing Co., Aurora, Ill., manufacturer of conveying, transmission and screening machinery, is erecting an addition to its main plant. This will complete the third section to its steel fabricating department which will total 220x300 ft.

Link-Belt Co., Chicago, Ill., recently adopted a new plan for bringing its distributor's key men to its factory, where these men may see the products in process of manufacture, listen to lectures and become more fully acquainted with the general manufacturing procedure, policy and personnel of the company. The Link-Belt Co. allows each distributor to select the salesmen for attendance at this "School on Manufacture," and pays all expenses incident to the three-day visit, except the value of the salesmen's time. On August 25-27, the company held such a school at its Ewart works in Indianapolis, those in attendance representing 14 distributors, scattered from Maine to Texas, who specialized in almost every industry. The "school" was under the direct supervision of George Torrence, sales manager, who said: "We are very much encouraged over the results of this school. Extremely flattering was the interest and keen attention displayed by these men who are not on the Link-Belt payroll. We expect to see an almost immediate response from this schooling in the way of increased volume and number of orders. It is our intention to make this distributor's school an annual affair."

Trade Literature

Byers Machine Co., Ravenna, Ohio. Bulletin 1049, featuring the largest crane of this company's line, described as the Model 10 full-revolving crane, of 10 tons capacity. Bulletin 1050 is a new 16-page treatise on the Truckrane, a light crane furnished unmounted for mounting on a motor truck chassis. Both bulletins are illustrated with photographs of the machines in actual operation and contain complete specifications. Those interested may obtain copies by writing to the company.

Foote Bros. Gear and Machine Co., Chicago, Ill., announces that it has under preparation a new bulletin entitled "Foote IXL Flexible Couplings," that will contain a great deal of valuable and instructive information pertaining to the use of flexible couplings for practically every purpose, from the smallest unit manufactured to couplings large enough to transmit several hundred horsepower. The bulletin will be ready for distribution in two or three weeks and it is recommended that any who are interested in the coupling of direct connected machinery send to the manufacturers for a copy. The company also announces that its new speed reducer catalog will contain 96 pages and will treat in detail of the many applications of speed reducing equipment to material handling equipment and to scores of manufacturing operations in nearly every industry. The catalog will be distributed free on request, and will make a valuable reference book for any engineer, superintendent, or maintenance man.

Compressed Air Society has published a pamphlet entitled "Trade Standards Adopted by the Compressed Air Society," embodying the result of extended study and research on the part of the executives and engineers associated with the members of that organization. It embraces the nomenclature and terminology relating to air compressors and their operations; a history of the development of speeds of air compressors; an explanation of capacities and pressures; instructions for the installation and care of air compressors with illustrations of devices suggested for cleaning the intake air; recommendation for the lubrication of air compressing machines and the cleaning of air receiver piping; a description of the low pressure nozzle test recommended by the society, and a partial list of applications of compressed air. The society publishes this pamphlet with the belief that there is a need for such an authoritative work of reference and that compressed air engineers and users as well as manufacturers of air compressors will appreciate this step toward the establishment of definite trade standards in the industry. Copies may be had from the members or by addressing the secretary of the society, C. H. Rohrbach, 50 Church street, New York.

Speech of Frederick W. Kelley at Unveiling of Tablet to Joseph Aspdin

FREDERICK W. KELLEY, president, Helderberg Portland Cement Co., recently unveiled a tablet to Joseph Aspdin, commemorating the 100th anniversary of the patenting of portland cement at Leeds, England. He said in part:

We are gathered here today to pay tribute to the memory of an Englishman of humble station, because 100 years ago he secured a patent upon portland cement and in so doing left a definite footprint on the sands of time.

It is hard to visualize the industrial conditions of 100 years ago. Chemistry was generally confined to laboratory experiments. Power was limited. Industry was largely individual. Man up to this time had used materials as he found them, provided by nature. A few simple melting, burning and grinding operations formed the only exceptions.

It required the real pioneer spirit for Aspdin to thoroughly blend dissimilar materials ground to extreme fineness and from them to produce the new portland cement by burning and grinding. It was the same Anglo-Saxon spirit which has explored and settled continents.

Progress is made by men who see a little beyond their neighbors and act upon their vision. Aspdin without modern tools or modern knowledge did see and did take a distinct progressive step from which the world has ever since benefited. Most great inventions look easy in the light of accumulated knowledge.

What would our present world be without portland cement? If we are wise, we sleep in concrete fireproofed houses. We bathe in water impounded by concrete dams and flowing through concrete pipes. We dress in clothes the perfection of whose weave is due to vibrationless concrete factories on concrete foundations.

We breakfast upon food brought to town over concrete highways and pavements with concrete foundations, from farms having concrete silos, feeding floors, water-troughs, fence posts and buildings. We pass to our concrete office buildings through concrete subways and over concrete platforms and sidewalks.

We plan for the transport of our goods over railroads having concrete bridges, trestles, retaining walls and tunnels, to steamships using concrete docks, walls, breakwaters and lighthouses. We read our evening paper by light generated in machinery set on concrete foundations, the current passing through wires supported upon concrete poles or placed in concrete ducts.

Concrete contributes to our safety, comfort and convenience, in a thousand ways. Because of the ease with which it can be used and its relatively low cost, it has permitted the accomplishment of many things not otherwise commercially practical.

Had masonry been used in the structures which have been built of portland cement during the past century, the additional cost would have approximated a quarter of the present public debt of Great Britain. This assumes that it would have been possible to use other materials than concrete in some of these structures.

The complete binding and oneness of thought, of spirit and of high purpose of the portland cement manufacturing industry in Great Britain and in the United States is exemplified by this tablet which in the name of the Portland Cement Association of America I present, and now unveil as a permanent evidence of our esteem and sincere good will. I believe it typifies the equally complete sympathy and regard existing between our respective countries.

Holders of Phoenix Preferred Stock Assured of 4 Per-Cent in 1925

PREFERRED stock of the Phoenix Portland Cement Co. "should pay at least 4% in 1925 and will be on approximately a 6% basis by 1926," Freeman T. Eagleson, receiver for this Dollings subsidiary, has announced.

The report shows income received up to July 1, 1924, amounting to $140,005.38, royalties from the Pennsylvania corporation now operating the Birmingham plant of the Phoenix Portland Co. under lease.

Included among expenditures is listed $115,950.27, balance due on a loan obtained from the American Trust Co. of Boston by the Dollings management.

Incidental expenditures swell total disbursements to $123,429.36, leaving a cash balance on hand amounting to $16,576.02. The report points out that under terms of the present lease a minimum royalty of $37,500 is due Sept. 30 and a like amount Dec. 31.

After recapitulating the $60,000 allowance made by Judge E. B. Kinkead for receiver and attorneys' fees, Mr Eagleson makes the announcement that "the costs of this receivership from now to its termination ought to be relatively small."

Relative to possibility of collecting a claim amounting to $371,546.55 against the Dollings Co., Mr. Eagleson says: "The impression seems to be, I regret to say, that the Dollings Co. will not pay a very high percentage of the face of the claims against it."—*Columbus (Ohio) Journal.*